

ATTACHMENT SECURITY AS THE SOCIAL FOUNDATION OF MINDFULNESS: AN
EXPLORATION INTO THE POTENTIAL MEDIATING ROLE OF DIALECTICAL
THINKING

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Philosophy

By

David C. Wang

August, 2012

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Wang, David C. "Attachment Security as the Social Foundation of Mindfulness: An Exploration into the Potential Mediating Role of Dialectical Thinking." Unpublished Doctor of Philosophy Dissertation, University of Houston, August, 2012.

Abstract

A substantial and growing base of empirical research on the construct of mindfulness attests to its relationship with a variety of measures of psychological well-being as well as its effectiveness as a treatment for a growing number of mental disorders. However, little is known concerning the social and/or psychological antecedents that hinder or support its development (Brown & Ryan, 2003). In response to this gap of knowledge, Shaver et al. (2007) conjectured that attachment security serves as the social foundation of mindfulness, citing several studies whose findings indicate that the two constructs share similar precursors, correlates, and outcomes (e.g., lower stress reactivity, improved mental and physical health, greater relationship satisfaction).

Following Shaver et al.'s (2007) understanding of attachment security as the social foundation of mindfulness, this present study sought to shed light on the mediating processes which facilitate the internalization, identification, and integration of prior experiences with attachment figures into dispositional mindfulness by inviting a sample of University of Houston undergraduate students to complete measures of these constructs as well as measures of dialectical thinking. Structural equation modeling was used to explore the potential role of dialectical thinking, an indicator of cognitive flexibility drawn from East Asian philosophy and religious traditions, in mediating the relationship between attachment security and mindfulness. Because individuals who are securely attached have already demonstrated some level of success synthesizing their dialectical needs for interrelatedness and autonomy, it was anticipated that these

individuals inherently possessed an enhanced capacity for dialectical thinking. More specifically, I hypothesized that securely attached individuals should be more mindful than their less secure peers in part because they more readily identify and accept the paradoxical, fluid, and inter-related nature of human experience. Results from statistical analysis indicated that dialectical thinking did not significantly mediate the relationship between attachment security and mindfulness. Rather, analysis of an alternative structural model indicated that attachment security significantly mediated the relationship between dialectical thinking and mindfulness. Implications of these results for both clinical practice and future research concluded this study.

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Chapter 1: Introduction

Dialogical Meeting According to Martin Buber

The innateness of the longing for relation is apparent even in the earliest and dimmest stage. Before any particulars are perceived, dull glances push into the unclear space toward the indefinite; and at times when there is obviously no desire for nourishment, soft projections of the hands reach, aimlessly to all appearances, into the empty air toward the indefinite....Precisely this motion will gain its sensuous form and definiteness in contact with a shaggy toy bear and eventually apprehend lovingly and unforgettably a complete body; in both cases not an experience of an object but coming to grips with a living active being that confronts us... it is not as if a child first saw an object and then entered into some relationship with it. Rather, the longing for relation is primary...and the relation to that...comes second.

Buber (1970, p.77-78)

The thought of Martin Buber, keenly articulated in his classic work titled *I and Thou* (1937/2003), has birthed a profound and sustained impact on a wide range of fields of study: anthropology, sociology, existential philosophy, theology, and psychoanalysis—just to name a few. Buber asserted that relationship—not cognition—was the ultimate purpose of life (Ventimiglia, 2008). In sharp contrast to Descartes, Buber emphatically asserted: “In the beginning is relation.” (Buber, 1970, p. 69) He believed that modern thinking, which was characterized by secularism, scientism/radical empiricism, and rampant individualism, had become so entrenched in modern life that human beings were becoming more and more isolated—isolated from each other, from themselves, and ultimately from God (Watson, 2006). In contrast to Enlightenment-based conceptualizations of the “self” which are isolated (what Buber would describe as the “severed I”), Buber conceptualized the “self” in terms of relationships. Specifically, he proposed two distinct attitudinal relationships for the “I:” the *I-Thou* and the *I-It* (Watson, 2006).

An *I-Thou* relationship entails a deep and mysterious personal engagement with the “other.” The “other,” in this case, is rather broadly defined—it can refer to oneself, other people, God, the world, or even nature (Adams, 2007). This approach to relationship experiences the other through an immediate or direct encounter in which the other is affirmed as vibrant and dynamic, is beheld and revered in its totality (i.e., holistically), and is viewed as unique, freely choosing and deciding its way of being (Cooper, 2003). A genuine dialogue can only occur under such a relational context. For Buber, genuine dialogue involves a turning towards the other as well as an openness to be addressed by the other from the perspective of the other. Both parties are present to the uniqueness of the other; both parties ‘confirm’ the other’s uniqueness (Nanda, 2006). The distinction between the actor and the one being acted upon is blurred because of the reciprocity that exists in the dialogue. Buber explained, “Relation is reciprocity. My You acts on me as I act on it.” (Buber, 1970, p. 67)

An *I-It* relationship, on the other hand, entails a different kind of relationship with the “other.” This manner of relating is tied to the axioms of logical empiricism/positivism (i.e., a form of empiricism that bases all knowledge on perceptual experience as opposed to intuition or revelation): objectivity, determinism, abstractive contemplation, and a utilitarian approach to the other (Watson, 2006). It relates to the other in such a way that the other is observed or related to rather than experienced; the other is objectified, is viewed in fragments (i.e., separate distinguishable characteristics rather than as a whole), is understood in a deterministic fashion (i.e., through a series of cause-and-effect laws that can be manipulated), and is taken as an instrument to be used as a means of self-actualization (Cooper, 2003). Moreover, in an *I-It* relationship, one

interacts in an indirect way via the ‘social self,’ which is neither unique nor an accurate representation of one’s true self (Nanda, 2006). Under such an interpersonal context, there is a clear distinction between the actor and the one being acted upon; in contrast to the dialogue that occurs in an *I-Thou* relationship, the *I-It* relationship is relegated to a monologue.

It is important to note that Buber’s distinction between *I-Thou* and *I-It* relationships was not a matter of right or wrong (Hycner, 1991). In fact, Buber conceded that it was difficult, if not impossible, to sustain *I-Thou* relationships throughout all one’s human interactions. *I-It* relationships were necessary for society to operate. Rather, his point was that alienation and isolation occur when one’s relational landscape is overwhelmingly dominated by an *I-It* approach to relationships—an occurrence that unfortunately has been facilitated and has become more commonplace within modern Western society. Notably, it is through objectifying and separating from others (i.e., *I-It* relationships) that human beings can progress from an undifferentiated state of connectivity towards a deeper and more profound encounter (i.e., *I-Thou* relationships); the *I-Thou* and *I-It* approaches to relationship are therefore understood as dialectically related (Cooper, 2003).

Cooper (2003) keenly posited that Buber’s *I-Thou* and *I-It* distinction could also be applied only an intrapersonal plane. Leveraging Herman’s (2001a) model of the polyphonic self (i.e., the self as multiple “I’s” that relate to each other and that these intrapersonal relationships are related to psychological well-being and distress), he argued that one could relate to oneself in a manner resembling the *I-Thou* as well as an *I-It*. One could relate to and experience oneself in a dialogue—that is, as humanizing,

holistic, individuating, and choice-making. One could also relate to and experience oneself in a monologue—as pre-determined, fragmented, able to be manipulated in a mechanistic fashion, and objectified.

The nature of one's intrapersonal relationships bears significant relevance to one's psychological well-being and resilience. Notably, one's coping behaviors in response to psychological distress will take markedly different forms depending on the manner of one's intrapersonal relating. For example, intrapersonal *I-Thou* coping will more freely incorporate self-knowledge and personal insight even when one is confronted with aspects of the self that one finds unattractive or even repulsive. On the other hand, intrapersonal *I-It* coping will be marked by defensiveness and rigidity and will operate in such a way as to preserve a distorted, objectified, and fragmented view of the self.

The concept of mindfulness and the many mindfulness-based approaches to emotional self-regulation keenly illustrates how Buber's *I-Thou/I-It* distinction, as it is applied to an intrapersonal plane, can be leveraged to help understand and conceptualize the formation, maintenance, and alleviation of psychological distress. As will be evident shortly, mindfulness represents a unique, self-reflective, insight-based approach to the treatment of various mental disorders. Indeed, one may understand it as an approach to therapy which seeks to remedy an overly rigid *I-It* mode of self-relating by cultivating and enhancing an *I-Thou* mode of relating towards oneself.

The Construct of Mindfulness

Drawn from centuries-long Buddhist meditative practices, mindfulness represents a particular set of qualities of attention and awareness that can be cultivated and developed through meditation (Bear, 2003). Meditation, for our current purposes, can be

understood as the intentional self-regulation of attention from moment to moment (Kabat-Zinn, 1982). Historically, although mindfulness has been described as the “heart” of Buddhist meditation (Thera, 1962), like-concepts are also well-represented among contemplative movements in other religions—notably the Christian desert monastic movements of the first and second centuries as well as the contemplative writings of St. John of the Cross and St. Theresa of Avila (Wang, 2009). Contrary to its recent adaptation and utilization as a therapeutic technique in Western mental health, it is important to note that mindfulness-based practices did not originally come into being as a means to get anywhere or fix anything. Rather, it is an invitation to be where one already is and to know the inner and outer landscape of one’s direct experience in each moment. Responding to this invitation implies waking up to the full spectrum of one’s experience in the present moment (Kabat-Zinn, 2003). In contrast to mindfulness, mindlessness—its dialectical opposite—entails rushing through activities without being attentive to them, tripping over and breaking objects due to carelessness to one’s surroundings, failing to notice subtle feelings of psychological tension or discomfort, and/or finding oneself preoccupied with the future or the past (Germer, 2005).

The application of mindfulness-related concepts and practices into Western mental health is typically conducted in a manner independent from its original religious and cultural traditions. Kabat-Zinn offered an operational working definition of mindfulness: “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment.” (Kabat-Zinn, 2003, p. 145) Elsewhere, it has been described as “bringing one’s complete attention to the present experience on a moment-to-moment basis”

(Marlatt & Kristeller, 1999, p. 68). Together, mindfulness incorporates both an attentional component whereby one's conscious awareness is sustained to what is immediately occurring in the present moment (Brown & Ryan, 2003) as well as an affectionate, compassionate quality within the attending, whereby one sustains a sense of open-hearted, friendly presence and interest (Neff, Hsieh, & Dejitterat, 2005; Kabat-Zinn, 2003).

Highlighting the attentional component, Brown and Ryan (2003) described mindfulness as connoting conscious awareness, attention, and remembering. They described awareness as the “background radar of consciousness, continually monitoring the inner and outer environment.” (Brown & Ryan, 2003, p. 822) Said differently, awareness refers to the range of stimuli that may not be within one's center of attention but nonetheless remains within one's awareness. Attention, on the other hand, is “the process of focusing conscious awareness, providing heightened sensitivity to a limited range of experience.” (Brown & Ryan, 2003, p. 822) As alluded to earlier, attention is intertwined with awareness—what is brought into the center of one's attention is taken from the background of one's awareness. Last, remembering refers to the act of reorienting one's attention and awareness to current experience in a wholehearted, receptive manner. It requires a repeated and constant intention to disentangle oneself from any activity that presents itself as an obstacle to fully experiencing the present moment.

Highlighting the affectionate, compassionate quality of mindful attending, Neff (2003) defined, operationalized, and highlighted the clinical relevance of the construct of self-compassion. As previously inferred, self-compassion has more to do with one's

posture towards the self-reflective stimuli which materializes when one's focus is directed towards conscious awareness on present experience. To Neff (2003), self-compassion entails three core components: (a) being kind and understanding toward oneself in instances of pain or failure rather than being harshly self-critical, (b) perceiving one's experiences as part of the larger human experience rather than seeing them as isolating, and (c) holding painful thoughts and feelings in mindful awareness rather than over-identifying with them.

According to Neff (2003), compassion can be understood as being open to and moved by the suffering of others, to the extent that one wishes to act and ease their suffering. Similarly, self-compassion involves “being open to and moved by one's own suffering, experiencing feelings of caring and kindness toward oneself, taking an understanding, nonjudgmental attitude towards one's inadequacies and failures, and recognizing that one's own experience is part of the common human experience.” (Neff, 2003, p. 224) Self-compassion may be distinguished from narcissism in that it is open to recognize one's own faults and weaknesses rather than mask them with thoughts of grandiosity. Moreover, self-compassion may also be distinguished from self-pity in the sense that self-compassion does not tend to over-exaggerate one's own suffering but seeks to understand it as an experience that is common to all mankind. While self-pity tends to lead one towards greater isolation (i.e., “My suffering is so unique and intense, no one else can relate to my experience”), self-compassion produces the opposite effect by drawing oneself towards greater fellowship with others (i.e., “Others suffer just as I do; I am not alone in my suffering”).

A number of Western researchers and clinicians have introduced mindfulness practice into mental health treatment programs in a skills-based approach independent of the religious and cultural traditions of their origins (Baer, 2003). Kabat-Zinn's (1982) mindfulness-based stress reduction program (MBSR), which was originally developed to reduce stress among hospital outpatients suffering from chronic pain and other stress-related disorders, has grown in popularity and has been adapted to treat a number of other disorders including prostate cancer and psoriasis (Kabat-Zinn, 2003). Participants in MBSR are instructed to practice a number of mindfulness-based skills outside of group meetings for at least 45 minutes per day, six days per week. One example of a mindfulness skill is the body scan, an exercise in which attention is directed sequentially to numerous areas of the body while the participant is lying down with eyes closed. Sensations in each area of the body are carefully observed. Moreover, when emotions, sensations, or cognitions arise, they are observed non-judgmentally and then attention is returned to the present moment. Participants are encouraged to practice mindfulness during ordinary activities such as walking and eating.

Mindfulness-Based Cognitive Therapy (MBCT; Teasdale, Segal, & Williams, 1995), a manualized 8-week group intervention based largely on Kabat-Zinn's (1982) MBSR program, seeks to leverage the skills of attentional control taught in mindfulness meditation to help prevent relapse of major depressive episodes. MBCT draws its theoretical rationale from an information-processing theoretical perspective of depressive relapse, which suggests that recurrences of major depressive episodes are triggered by mild dysphoric states that reactivate depressive ruminative thinking patterns present in previous episodes. MBCT participants are taught to non-judgmentally observe their

thoughts, distinguishing (or detaching) themselves from their thoughts using phrases such as, “I am not my thoughts.” This decentered approach from depression-related cognitions is believed to deter the escalation of negative thoughts into ruminative patterns (Teasdale et al., 1995).

Dialectical-behavior therapy (DBT; Linehan, 1987), another structured therapy which incorporates mindfulness-related skills and competencies, is an empirically supported treatment for suicidal behaviors, borderline personality disorder, and substance abuse (Linehan, Heard, & Armstrong, 1993). One of the key therapeutic factors of DBT is that it seeks to enhance dialectical thinking patterns and replace rigid dichotomous thinking in individuals suffering various forms of psychological distress (Dimeff & Linehan, 2001). The fundamental dialectic in DBT consists of the validation and acceptance of the client within a context that simultaneously seeks to help them change (Dimeff & Linehan, 2001). Although the various mindfulness-based skills taught in DBT are similar to those in MSBR (i.e., nonjudgmental observation of thoughts, emotions, sensations, and environmental stimuli), the concepts are organized somewhat differently (Baer, 2003). Notably, DBT uniquely conceptualizes mindfulness skills within a dialectical framework synthesizing the dual goals of acceptance and change.

Attachment-related psychodynamics as a precursor of mindfulness-related competencies

Despite the recent popularity of mindfulness-based clinical interventions as well as empirical research, Brown and Ryan (2003) described the current body of knowledge on mindfulness as still very much in its infancy. They noted that although current research has found reliable individual variation in mindfulness-based competencies (they described mindfulness as a “natural” or inherent capacity that can be enhanced or

inhibited by developmental influences and/or intervention effects) and has identified relationships between mindfulness and various positive mental health outcomes, the question remains of “how this form of consciousness naturally develops and what psychological and social conditions support and hinder its dispositional and state level, or momentary expression.” (Brown & Ryan, 2003, p. 844)

An emerging line of both theoretical and empirical research has recently identified attachment-related psychodynamics as a potentially salient precursor to the development and enhancement of mindfulness. Shaver et al. (2007) proposed three connections linking attachment security and mindfulness. First, developmental research suggests that people who have experienced responsive, validating, and attentive caregiving are likely to be both more securely attached as well as develop greater reflective and regulative skills—including those associated with mindfulness (Fonagy & Target, 2005; Ryan, 2005). Second, mindfulness and attachment security share similar correlates and outcomes. Previous research indicates that mindfulness is related to lower stress reactivity, less need for defenses against threats to the self, better mental and physical health, better behavioral self-regulation, better academic outcomes, greater relationship satisfaction, and more constructive responses to relationship conflict (Ryan et al., 2007). Notably, attachment security is likewise related to these same variables (Shaver, Lavy, Saron, & Mikulincer, 2007). Third, empirical evidence suggests that attachment and mindfulness-related processes may in fact be related bi-directionally. For example, Allen and Fonagy’s (2006) research on mentalization indicated that attachment security is integrally involved in a form of mindfulness which involves the awareness and articulation of one’s own (as well as one’s romantic partner’s) thoughts, needs, motives,

and feelings. Similarly, initial evidence also suggests that mindfulness is related to the securely attached adult relationship style (Cordon & Finney, 2008).

Despite such strong evidence associating attachment security with mindfulness, Ryan et al. (2007) were quick to warn that important distinctions exist as well. Namely, they suggest that the primary difference between the two concepts concerns the place of the self in optimal functioning. An attachment perspective would argue that optimal functioning is mediated by a set of secure cognitive representations (i.e., an internal working model) of the self and others which integrate themes such as safety, security, meaning, and self-worth. A mindfulness perspective, on the other hand, would argue that optimal functioning is characterized by an ability to be present and available to immediate and ongoing experience (e.g., the experience of intimacy, of being with another) without the need of having experience filtered through past attachment-related histories. Mindfulness therefore enables an individual to transcend biases developed from past history, thereby opening up greater opportunities for connection and closeness, satisfaction with life, and successful threat management in relationships.

In stark contrast to Ryan et al.'s (2007) concerns regarding the ultimate viability of attachment security as a social foundation for the development of mindfulness, Shaver et al.'s (2007) perspective was far more optimistic. Citing the Buddhist context that mindfulness was originally associated with, they argued that the original goals of mindfulness included not only healthy emotion regulation but also the cultivation of a sense of social responsibility towards all human beings—a goal that has been largely lost in its adaption into the individualistic, therapeutic world of Western mental health. They concluded by suggesting that placing mindfulness within an attachment framework would

allow it to “benefit not only from additional kinds of empirical tests but also from an assortment of ethical, social, and developmental, yet not necessarily religious, concepts.”

(Shaver et al., 2007, p. 266)

Proposed Research

In keeping with Brown and Ryan (2003)’s call for future research investigating the psychological and social conditions that support or hinder the development of mindfulness, the purpose of the proposed research was to extend current lines of inquiry concerning the relationship between attachment security and mindfulness. Like Shaver et al. (2007), I believe that attachment theory provides a viable and rich theoretical framework to understand the social foundations that support the formation and development of mindfulness. Drawing from insights gathered from Martin Buber’s theory of dialogical meeting, I further propose that mindfulness itself can be effectively understood as an expression of a specific kind of dialogical relationship—namely, an I-Thou relationship with the self. Said differently, the various cognitive and attentional competencies related to mindfulness which enable an individual to nonjudgmentally pay attention to present experience naturally give rise when an individual relates to himself/herself via a humanizing, holistic, individuating, choice-making dialogue. As Shaver et al. (2007) asserted, the formation of such a compassionate, fully-present, and caregiving relationship with oneself (i.e., an intrapersonal I-Thou relationship) involves a process whereby comforting and encouraging interactions from prior relationships with attachment figures are internalized, identified with, and become integrated into one’s personality and one’s intrapersonal (as well as interpersonal) relational landscape.

What then can be said about the mediating processes that facilitate the internalization, identification, and integration of prior experiences with attachment figures into a disposition for mindfulness? This present study sought to investigate this question by exploring the potential mediating role of a third construct, dialectical thinking. Therefore, the purpose of the proposed study was to test a research model that includes measures of attachment security, measures of dialectical thinking, and measures of mindfulness. Specifically, I proposed that contributions of secure attachment to mindfulness are in part mediated by an enhanced capacity for dialectical thinking. In the following chapter, I will present a more focused and selective review of the research literature on mindfulness, attachment security, and dialectical thinking, and then synthesize this discussion in a manner that establishes impetus for the emerging research model.

Chapter 2: Mindfulness, attachment security, and dialectical thinking: A focused and selective review of the literature

Mindfulness and its role in psychological well-being

Commenting on the usual state of consciousness in the average person, William James (1924) asserted, “Compared to what we ought to be, we are only half awake” (p. 237). In fact, mindfulness-based clinical interventions share this perspective and seek to remedy it by cultivating a state of consciousness that is characterized by clarity and vividness of current experience (Brown & Ryan, 2003). Conceptually, mindfulness is understood to contribute to symptom reduction and psychological well-being through several mechanisms, as will be outlined below.

Kabat-Zinn (1982) identified exposure as a salient mechanism of change in the application of MBSR to patients with chronic pain. Instead of shifting one’s physical position to relieve pain, MBSR instructs patients to instead focus their attention directly on the pain sensations along with their accompanying thoughts, emotions, and urges, and to assume a non-judgmental attitude toward these sensations. It is thought that prolonged exposure to the sensations of chronic pain, in the absence of feared and impending catastrophic consequences, might lead to desensitization and a progressive lessening of excessive emotional reactivity to pain sensations. Thus, even if pain sensations were not reduced, suffering and distress might be assuaged (Kabat-Zinn, 1982). The practice of mindfulness skills may therefore improve the patient’s ability to tolerate and effectively cope with negative emotional states because they circumvent the patients’ tendency to avoid or escape them (Baer, 2004).

As alluded to earlier, the practice of mindfulness may also lead to changes in one's thought patterns as well as one's attitudes about their thoughts. Mindfulness training helps patients identify and apply descriptive labels to anxiety-related or depression-related thoughts. By doing so, patients cultivate an understanding that such thoughts are "just thoughts"; cognitive change therefore occurs as a result of viewing one's cognitions as temporary phenomena rather than reflections of truth or reality that necessitate escape or avoidance behavior (Baer, 2004). In addition, mindfulness training explicitly precludes any evaluation of thoughts as rational or distorted, or any systematic attempts to change thoughts judged to be irrational. Rather, patients are encouraged to nonjudgmentally accept the full spectrum of their present experience—pain, urges, other bodily sensations, cognitions, and emotions—without trying to change, escape, or avoid them. According to Teasdale et al. (1995), this nonjudgmental, decentered view of one's cognitions encouraged by mindfulness training is what interferes with the ruminative patterns believed to precipitate relapse among previously depressed individuals. Likewise, Kristeller and Hallett (1999) assert that mindfulness training enhances binge eaters' ability to cope with and accept aversive cognitions that lead to binge eating, such as unfavorable comparisons of self to others and perceived inability to meet others' demands.

A substantial and growing base of empirical research confirms that the attentional and nonjudgmental qualities associated with mindfulness are associated with a variety of measures of psychological well-being. Brown and Ryan (2003) developed the Mindful Attention Awareness Scale (MAAS), a psychometrically-sound and commonly-used measure which assesses individual differences in the frequency of mindful states over

time. Rather than attempting to also capture the open, accepting, and empathetic quality of mindful attending, the researchers chose to focus on “the presence or absence of attention to and awareness of what is occurring in the present” (Brown & Ryan, 2003, p.824), hypothesizing that this attentional quality is what is foundational to mindfulness and thus a valid starting point in research.

Correlational, quasi-experimental, and laboratory studies demonstrated that the MAAS measured a unique quality of consciousness that is related to psychological well-being. Among a sample of college students as well as a general adult sample, MAAS scores were moderately and negatively correlated with neuroticism—a “Big Five” personality trait (Costa & McCrae, 1992) that has been consistently related to poorer psychological well-being. MAAS scores were also related to other indicators of well-being, both positive and negative, in expected directions. For example, these scores were inversely related to negative affectivity, somatization, depression, and anxiety. Conversely, scores on the MAAS were positively related to scores in measures of positive affectivity, life satisfaction, self-esteem, subjective vitality, self-actualization, autonomy, and relational fulfillment. Among a clinical sample of breast and prostate cancer survivors that participated in mindfulness training, mindfulness was found to be associated with lower levels of mood disturbance as well as stress both before and after the intervention (Kabat-Zinn, 2003).

Employing an experimental research design, Brown and Ryan (2003) demonstrated that mindfulness was also associated with greater self-awareness (operationalized as awareness of one’s implicit emotional state). They theorized that effective emotional self-regulation, an important component to well-being, is dependent

upon one's capacity for self-insight. The results of their study indicated that mindfulness moderated the relationship between implicit and explicit affect congruence, such that more mindful individuals demonstrated a significantly greater degree of congruence between self-reported (explicit) affect and implicit affect (as measured by a response-latency computer program).

In contrast to Brown and Ryan (2003), whose research on mindfulness exclusively focused on its attentional qualities, Neff (2003) developed a scale measuring self-compassion (Self-Compassion Scale; SCS), which assesses one's tendency to be open and moved by one's own suffering as well as one's tendency to take an understanding, nonjudgmental attitude towards one's inadequacies and failures, viewing one's own experience in the context of common human experience. Self-compassion was conceptualized as a useful emotional regulation strategy that leads to better mental health outcomes by disrupting the cognitive processes that amplify and perpetuate self-condemnation—a contributor to anxiety and depression. Not only so, self-compassion effectively transforms negative self-affect (i.e., feeling bad about one's inadequacies or failures) into positive affect (i.e., feeling kindness and understanding towards oneself) without compelling an individual to protect or bolster one's self-concept—a tendency that may be inherent in concepts such as self-esteem and narcissism (Neff, 2003).

In its initial validation study, SCS scores significantly predicted a variety of mental health outcomes, both positive and negative, in expected directions. Self-compassion was negatively correlated with scores on measures of depression and anxiety, neurotic perfectionism, narcissism, and rumination; likewise, they were positively correlated with overall life satisfaction and emotional coping scores (Neff, 2003). A

study investigating the coping behaviors of college students facing an academic failure reported that self-compassionate students demonstrated lower levels of self-criticism, isolation, and over-identification with their failure (Neff, Hsieh, & Dejitterat, 2005). The researchers concluded that self-compassion facilitates the learning process by helping students to focus on mastering tasks at hand rather than worrying about performance evaluations and by fostering an intrinsic motivation to learn. Leary et al. (2007) conducted a series of studies involving college students who faced a variety of distressful events. They demonstrated that self-compassion predicted greater frequency of emotion-focused coping responses, cognitive reactions that involved less catastrophizing and less personalizing, and less extreme behavioral inclinations even after statistically controlling for self-esteem.

In summary, although research on mindfulness is still in its early stages, an increasingly robust base of empirical evidence identifies mindfulness as a construct that is uniquely related to psychological well-being. In recent years, a number of psychometrically-sound scales measuring different facets of mindfulness have been developed and researchers have since leveraged these tools to demonstrate the predictive power of mindfulness on various well-being constructs via correlational, quasi-experimental, laboratory, and field studies. Moreover, structured clinical interventions incorporating mindfulness-based skills have grown in popularity and have received considerable empirical validation as treatment for a variety of mental disorders. In the next section, I will present selected studies that highlight the relationship between mindfulness and attachment security.

Empirical evidence linking mindfulness with attachment security

As previously noted in the preceding chapter, Shaver et al.'s (2007) proposed three connections linking attachment security and mindfulness. First, they cited developmental research which suggests that people who have experienced responsive, validating, and attentive caregiving are likely to be more securely attached as well as develop greater reflective and regulative skills—including those skills associated with mindfulness (Fonagy & Target, 2005; Ryan, 2005). Much of what is known in this area of study is based on Peter Fonagy's expansive work on mentalization and reflective functioning. Like mindfulness, mentalization is also associated with a number of cognitive capacities that include attentional control as well as affect identification, representation and regulation. Mentalization is defined as an individual's largely preconscious capacity to perceive and interpret human behavior (one's own as well as those of others) in terms of intentional mental states—needs, desires, feelings, beliefs, goals, and purposes (Fonagy & Target, 2006). Reflective functioning, on the other hand, is simply the overt manifestation of an individual's mentalizing capacity; the term, parental reflective functioning, would therefore refer to parents' demonstrated aptitude to reflect upon their own as well as their child's internal mental experience (Slade, 2005).

This process of perceiving and making meaning of internal states serves crucial intrapersonal functions that sharply resemble mindfulness-related competencies: it provides the means to discover vital aspects of subjective experience, it allows for deep and broad self-knowledge, and it facilitates the development of self and affect regulation (Slade, 2005). Because of this, Fonagy et al. (2002) asserted that the more individuals are able to envision mental states, the more likely they are to feel autonomous, connect to

others at a subjective level, and engage in productive, intimate, and sustaining relationships. It is noteworthy that these outcomes are all likewise associated with secure attachment (Shaver et al., 2007).

Fonagy and Target (2005) argue that infant attachment relationships help to properly organize the processes that underlie the development of social cognition, equipping an individual for a collaborative existence with others. Among a sample of 40 mothers and their babies, Slade et al. (2005) reported that the mother's capacity to mentalize significantly predicted both adult attachment as well as infant attachment classifications. First, they found that securely attached mothers demonstrated significantly higher reflective functioning scores than dismissing ($p < .023$), preoccupied ($p < .043$), and unresolved mothers ($p < .001$). Although the sample size for this study was modest, a large effect size was found ($d = 1.01$). Second, mothers of securely attached infants (infant attachment was measured by the Strange Situation) likewise demonstrated significantly higher reflective functioning scores than those of resistant ($p < .003$) and disorganized children ($p < .014$). Again, a large effect size was found ($d = .81$).

In making their case for the interrelatedness of mindfulness and attachment theory, Shaver et al. (2007) also noted that attachment and mindfulness-related processes may in fact be related bi-directionally. Concerning the predictive capabilities of mindfulness on attachment, Bouchard et al. (2008) found that individuals who demonstrated greater clarity and complexity in their representations of mental states (whether of self or of others) tended to exhibit lower attachment insecurity. On the other hand, Mikulincer (1997) reported that securely attached people are less biased by self-

serving needs and defenses, such as the need for self-enhancement, the need for consensus and uniqueness, rigid defenses of existing knowledge structures, and defenses of cultural worldviews in the face of reminders of mortality.

In a validation study of the MAAS, Cordon and Finney (2008) was able to successfully re-confirm the scale's 1-factor model structure of mindfulness across all attachment style groups and, as predicted, also found that securely attached persons reported significantly higher levels of mindfulness than did insecurely attached persons. Walsh et al. (2009) conducted a correlational study which sought to identify possible predictors of individual differences in naturally occurring mindfulness. Although the researchers suspected that individual differences in mindfulness will eventually prove to be multiply determined, a decision was made to begin their investigation with developmental and personality-related predictor variables; in light of this, the constructs of attachment anxiety, attachment avoidance, and trait anxiety were included in their research model. Noting that mindfulness entails the ability to directly observe one's experiences rather than observing them through various filters of beliefs and expectations, they hypothesized that both attachment anxiety and attachment avoidance would be negatively predictive of mindfulness. The authors suspected that anxious-attached individuals would be less mindful due to corresponding hypersensitivity to rejection and/or excessive rumination on personal deficiencies. Likewise, avoidant-attached individuals would also be less mindful due to corresponding thought suppression, relationship avoidance, and person perception biases. Last, trait anxiety was also hypothesized to be negatively predictive of mindfulness because individuals high in trait anxiety are thought to endorse attentional and interpretative biases that lead them to

be more likely to detect and interpret stimuli as threatening. Their regression model with all three predictor variables together was statistically significant, accounting for 18% of the observed variance in mindfulness. Consistent with expectations, attachment anxiety and trait anxiety were identified as significant predictors of individual differences in mindfulness. However, attachment avoidance failed to significantly predict mindfulness during regression analysis despite a significant zero-order correlation with mindfulness; the researchers suggested that some features of attachment avoidance may actually be positively related to mindfulness—such as inhibited processing of threat and the non-elaboration of a broad range of cognitions.

As can be seen even in the aforementioned discussion, attachment theory represents a conceptually and empirically-viable theoretical model to understand the social foundations that lead to the development of mindfulness. Specifically, securely attached people tend to demonstrate enhanced capabilities to be mindful because they are less prone to the ruminative processes that often accompany attachment insecurity. In the next section, I will introduce the notion of dialectical thinking as a construct that potentially mediates the relationship between attachment security and mindfulness.

What is Dialectical Thinking?

Although the philosophy of dialectics dates back thousands of years in East Asian philosophy and religious traditions such as Confucianism and Buddhism (Peng et al., 1999), within the Western world, it is most associated with Marxist socioeconomic principles. Hegel is generally credited with reviving and elaborating the dialectical position in recent history. Hegel presented a system of exploring and understanding the world that serves as an alternative to the classificatory logic found in traditional science

(Berman, 1981). Hegelian dialectics is a philosophy of movement, whereby forms or arguments (thesis) create their own contradiction (antithesis), which is then negated by a synthesis of the two preceding arguments (synthesis). What remains constant in his model is the process of change. Within the field of developmental psychology, dialectical processes can also be observed as underlying all of Piaget's stages, for the mechanism of change from one stage to the next is the awareness of contradiction and the impetus for resolution (Riegel, 1973).

Dialectical thinking/philosophy can be distilled into three central principles (Peng & Nisbett, 1999): 1) the principle of contradiction (2 opposing propositions may both be true), 2) the principle of change (the universe is in flux and is constantly changing), and 3) the principle of holism (all things are inter-related). Dialectics considers all things within the context of their mutual relations of dependency, recognizing them not as fixed or static, but rather as engaged in an ongoing process of change and development (Thalheimer, 1927). Dialectically-oriented individuals tend to see the nature of the world (and the self) in such a way that masculinity and femininity, strength and weakness, good and bad, and so on exist in the same object or event simultaneously; moreover, they regard such duality as both normative as well as adaptive (Spencer-Rodgers et al., 2009). It has been observed that dialectical thinking becomes increasingly important and common with age—Peng and Nisbett (1999) observed that middle-aged and older adults are more likely to accept contradiction in reality and to synthesize contradiction in their thinking than were young people. As alluded to previously, Piaget's developmental model illustrates this tendency as well—during his proposed fifth stage of development, Piaget posited that the adult becomes aware of the inherently changing and contradictory

nature of reality and on the subjectivity of knowledge, ultimately becoming cognizant of the dialectical nature of self-development (Kramer et al., 1992).

In contrast to dialectical thinking, classical or Aristotelian thinking can be characterized by the three following principles: 1) the principle of identity (if A is true, then A is always true), 2) the principle of non-contradiction (A cannot equal not A), and 3) the principle of the excluded middle (all propositions must be either true or false, but not both) (Peng & Nisbett, 1999). Individuals whose worldview is predominantly Aristotelian will tend to be more linear or synthetic in their cognitive orientation; they will consider both sides of an opposing argument and then search for a clear resolution of the incongruity (Spencer-Rodgers et al., 2009); to them, incongruity or contradiction is seen as incorrect or undesirable (Kramer et al., 1992). They believe in the constancy of the world and in the possibility of decontextualized propositions—that is, to understand them just in relation to one another rather than attending also to a larger field of facts and theories in which the propositions are embedded (Peng & Nisbett, 1999). Aristotelian thinking, which can be understood as the opposite of dialectical thinking, views all things in isolation and considers them only in their fixity (Thalheimer, 1927).

The Dialectical Self-Concept and Mindfulness

The dichotomy of dialectical and Aristotelian epistemologies can be observed not only in the manner people understand and make sense of the external world, but also in the manner they understand and make sense of themselves. In fact, research suggests that this dichotomy of epistemologies may account for substantial variation in the structure and makeup of an individual's self-concept. Campbell et al. (1996) posited that the content of one's self-concept includes both beliefs about personal attitudes (e.g.,

personality traits and physical characteristics) coupled with episodic and semantic self-relevant memories. The content of one's self-concept can be characterized in greater proportion by social roles (Asian cultures) or by personality traits (Western cultures) (Spencer-Rodgers & Peng, 2004). Self-concepts also entail evaluative components which correspond to global self-esteem and are related to positive or negative assessments of one's personal attributes or of one's overall personhood (Campbell et al., 1996).

Spencer-Rodgers and Peng (2004) argued that individuals who endorse naïve dialecticism, a form of dialecticism common among East Asian cultures, tend to more comfortably acknowledge and accept psychological contradiction—that is, they tolerate and experience less distress and cognitive dissonance when confronted with two or more opposing attitudes, beliefs, memories, emotions, and/or self-perceptions. To illustrate, Spencer-Rodgers et al. (2004) observed that individuals from dialectical cultures are more likely to endorse apparently contradictory self-statements such as: “I am shy” and “I am outgoing.” These findings were successfully reproduced in a latter study involving an experimental design (Spencer-Rodgers et al., 2010). Dialectically-oriented individuals may assert that they possess both qualities of introversion as well as extroversion. Indeed, they may predominantly exhibit introversive tendencies in certain contexts (e.g., at school, at work) while exhibiting extroversive tendencies in other contexts (e.g., at home, at church) (Spencer-Rodgers & Peng, 2004).

Empirical evidence also suggests that dialectical thinking is positively related with coping flexibility. In three studies involving experimental, cross-sectional, and longitudinal designs, respectively, with samples of undergraduate Chinese students studying in Hong Kong, dialectical thinking was positively related with the ability to

formulate flexible coping strategies that meet the distinct demands of changing circumstances (Cheng, 2009). However, empirical evidence also indicates that individuals from dialectical cultures tend to report lower levels of self-esteem and psychological well-being even after statistically controlling for a variety of potential confounding factors such as moderacy bias (i.e., the tendency to avoid extremes and to respond neutrally), general suppression of mood, socioeconomic conditions, prejudice and other negative effects of minority status, and modesty (i.e., the tendency to present oneself in a more humble or modest light) (Crocker et al., 1998; Diener et al., 1995; Spencer-Rodgers & Peng, 2004). Although a plethora of factors have been proposed to explain these observed cultural differences in self-esteem and well-being, they will not be addressed here due to space limitations.¹

Instead, I propose that mindfulness meditation, as it was originally conceived centuries ago within Buddhist monasteries in East Asia, can be keenly understood as a strengths-based, contextually-appropriate approach to emotional regulation for dialectically-oriented individuals. As noted by Goetz et al. (2008), dialecticism makes the co-occurrence of positive and negative emotions more likely. As such, the attentional and evaluative processes associated with mindfulness provide dialectically-oriented individuals a framework to confront, accept, and cope with the challenges that often accompany complex and at times incongruent emotional responses. By training oneself to focus attention upon and fully experience the present moment, the multiple layers of one's emotional landscape, which can potentially give rise to defensiveness, self-judgment, and excessive rumination, are brought to light. Moreover, by guiding oneself

¹ A cogent discussion of these factors can be found in Spencer-Rodgers and Peng (2004) and Spencer-Rodgers et al. (2004)

to observe present experience in a non-judgmental manner, the potentially negative effects of such emotional complexity can be effectively managed and assuaged.

The fundamental relationship between dialectical thinking and mindfulness is that a dialectical cognitive orientation helps an individual to be open to and accept a broad range of available self-relevant information and emotions in the present moment (Goetz et al., 2008)—including negative self-relevant feedback, personal inadequacies, and negative emotions (Heine et al., 1999). These individuals would experience less need to preserve an attitude about oneself that is either good or bad, but not both (the principle of contradiction). For they will assert that positive self-knowledge can only hold meaning and be accurately understood in harmony with the negative (the principle of holism); to them, this harmony is ever-changing, which again precludes any attempt to preserve a static or rigid image of the self (the principle of change).

Because human experience does not readily fit into a linear, synthetic, and decontextualized epistemology, the dialectical orientation fits more closely with the paradoxical and at times seemingly contradictory nature of human existence. Indeed, even the experience of giving and receiving therapy can be most keenly articulated through the fundamental dialectic of validation and acceptance of the client within a context that simultaneously seeks to help them change (Dimeff & Linehan, 2001). As Thalheimer (1927) asserted, the origin of the law of dialectics is from the generalization of experience—that is, experience shows that in daily life as well as in science, the limits of what can be known are not rigid and fixed, but rather mobile, relative, and temporary. Ultimately, it is this shared compatibility and emphasis on phenomenology that links the constructs of mindfulness and dialectical thinking.

Dialectical Thinking and Attachment Security

To date, very little (if any) research has been conducted that specifically explores the relationship between dialectical thinking and attachment security. Preliminary evidence, however, suggests that the two constructs may share similar correlates. For example, Goetz et al. (2008) reported that dialectically-oriented individuals are more likely to spontaneously take the perspectives of others and to experience empathic emotions when exposed to various social events. They explained that dialectically-oriented individuals consider multiple explanations of an event as plausible and also tend to focus more on context and situation (as opposed to exclusively on their own perspective) to assess any given situation (Goetz et al., 2008).

Similarly, research on adult attachment among romantic relationships indicate that securely attached individuals demonstrate a greater tendency to experience empathy towards their romantic partner, are more interpersonally competent, and more commonly employ constructive conflict strategies that support both their own interests as well as the interests of the other (Cassidy & Shaver, 2008, p.467). Fonagy (2002) argued that the very development of secure attachment among infants is contingent upon the primary caregiver's ability to accurately and reliably recognize and reflect the child's internal states. Accurate representations of mental states, as modeled by caregivers, eventually enable a child to accurately perceive their own mental states as well as those of others. Conversely, if a caregiver's affect expressions are inaccurate (i.e., not contingent on the infant's affect), this will undermine the infant's ability to appropriately label the internal states of themselves or others—a significant precursor of attachment insecurity (Fonagy & Target, 2005).

In addition, a well-established base of empirical evidence has associated attachment security with indicators of cognitive openness and flexibility. Mikulincer (1995) reported that securely attached individuals are not only more able to recognize negative self-attributes, but they also show low self-discrepancies (i.e., differences between their actual self and ideal self). In contrast, avoidant individuals tended to admit only positive self-attributes while concurrently showing high self-discrepancies. Similarly, secure attachment has also been found to be associated with greater cognitive openness within the context of close relationships (Mikulincer & Arad, 1999), less cognitive closure in making social judgments (Mikulincer, 1997), greater empathic concern and perspective taking (Joireman, Needham, & Cummings, 2002; Mikulincer et al., 2005), greater interpersonal authenticity (Gillath, Sesko, Shaver, & Chun, 2010), and higher endorsement of self-transcendent values and approaches to thought such as benevolence and universalism (Mikulincer et al., 2003). Conversely, Edelstein and Gillath (2008) reported that attachment avoidant individuals exhibited greater attention inhibition to potentially threatening information.

Conceptually, attachment theory fits well within a dialectical framework. Following Brennan, Clark, and Shaver's (1998) conceptualization of adult attachment in terms of two orthogonal dimensions (attachment anxiety and attachment avoidance), secure attachment can be understood as an individual's success in synthesizing and simultaneously satisfying their (dialectical) need for both connectedness and autonomy. Attachment anxiety would represent an inability to synthesize the need for connectedness while maintaining autonomy, whereas attachment avoidance would represent an inability to synthesize the need for autonomy while maintaining connectedness. Tuber (2008) was

also keen on dialectical attachment-related processes when he wrote of the meaning-making processes that occurred while an infant breastfed; during such a context, the child must satisfactorily reconcile “instinctual urges and predatory ideas toward the caregiver.” Said differently, even as the infant is emotionally and physically attached to the mother during breastfeeding, the child must satisfactorily reconcile two simultaneous and seemingly-conflicting drives: the drive to be fed and to satisfy his/her hunger and the drive for connectedness and relationship seeking. Human experience, especially attachment-relevant social experiences during childhood/infancy, often follows dialectical processes.

In summary, conceptual as well as preliminary empirical evidence suggest that attachment security and dialectical thinking may in fact be interrelated. Conceptually and experientially, secure attachment represents the synthesis of one’s dialectical need for interrelatedness and autonomy. It would follow that a securely-attached individual would inherently possess an enhanced capacity for dialectical thought—having personally experienced what it is like to be simultaneously intimately-connected and autonomous, such an individual would likely be more open to viewing themselves, others, and the world from a dialectical perspective of paradox, change, and holism.

Conclusion: A Proposed Model Interrelating Attachment Security, Dialectical Thinking, and Mindfulness

In this chapter, I explored the recent emergence of mindfulness within the context of Western mental health, taking special note of the mounting empirical support attesting to its relationship with a variety of measures of psychological well-being as well as its effectiveness as a treatment for a growing number of mental disorders. Furthermore, I

also highlighted selected studies that illustrate the interrelationship between mindfulness and attachment security, as proposed by Shaver et al. (2007). Research suggests that mindfulness and attachment security share similar precursors (i.e., responsive, validating, and attentive caregiving), share similar correlates and outcomes (e.g., lower stress reactivity, better mental and physical health, greater relationship satisfaction), and may in fact be bi-directionally related.

Dialectical thinking, a construct of cognitive flexibility drawn from East Asian philosophy and religious traditions, was then introduced as a construct which could potentially mediate the relationship between attachment security and mindfulness. Because individuals who are securely attached have already demonstrated some level of success synthesizing their dialectical needs for interrelatedness and autonomy, they therefore inherently possess an enhanced capacity for dialectical thinking. This enhanced capacity for dialectical thinking may in fact help explain previously-observed differences in mindfulness-related processes across attachment styles—for instance, it would help explain why securely attached individuals have been found to demonstrate greater levels of mindfulness relative to insecurely attached individuals (Bouchard et al., 2008; Cordon & Finney, 2008).

The conceptual model for the proposed research study is presented in Figure 1. According to this model, I hypothesize that dialectical thinking will partially mediate the contribution of attachment security to mindfulness. By testing the proposed model (which will be presented in the next chapter in more detail), the investigator hopes to further establish attachment theory as a rich and viable theoretical framework to understand the social foundations that support the formation and development of

mindfulness by demonstrating that securely attached individuals are more mindful in part because they more readily identify and accept the paradoxical, fluid, and inter-related nature of human experience.

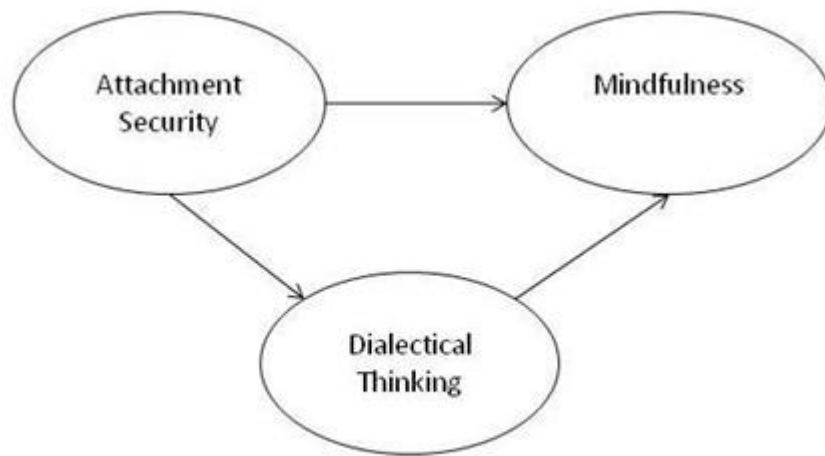


Figure 1. Theoretical Model of Attachment Security, Dialectical Thinking, and Mindfulness.

Chapter 3: Methodology

Participants and Procedure

For the purposes of this study, the data were collected from 300 participants, who were recruited online via SONA. Of the 300 participants who completed the study, data from 18 individuals were removed due to blatantly problematic response patterns (data screening procedures will be outlined in more detail later). The age of the participants ranged from 17 to 54 ($M = 22.11$, $SD = 4.365$). Reflecting the demographic characteristics of the College of Education at the University of Houston, most participants were female (85.9%). No single racial group comprised a majority of the sample; the largest group consisted of participants who identified themselves as White or European American (28.6%), with several others identifying themselves as Asian or Pacific Islander (25.1%), Latino or Hispanic (24.0%), Black or African-American (16.3%), Middle Eastern (4.9%), and other (1.1%). The distribution of the sample by self-reported ethnicity and self-reported religious affiliation are reported in Table 1 and Table 2, respectively.

Table 1
Sample Distribution by Self-reported Socio-Economic Status of Family of Origin

Self-Reported Socio-Economic Status	<i>N</i>	<i>% of total</i>
Upper class	5	1.8
Upper-middle class	67	23.7
Middle class	122	43.1
Lower-middle class	77	27.2
Lower class	12	4.3

Table 2
Sample Distribution by Self-reported Religious Affiliation

Self-Reported Religious Affiliation	<i>N</i>	<i>% of total</i>
Agnostic	20	7.1
Atheist	14	4.9
Buddhist	18	6.4
Christian-Catholic	90	31.8
Christian-Protestant/Evangelical	53	18.7
Christian-Protestant/Mainline	31	11.0
Judaism	5	1.8
Muslim	21	7.4
Other	31	11.0

Extra credit was awarded in exchange for participation in the study, which typically required approximately 60 minutes to complete. Once participants enrolled for the study on SONA, they were asked to complete a short demographic questionnaire accompanied by a series of psychological measures assessing attachment security, dialectical thinking, and mindfulness-based self regulation. The entire study was hosted on SONA; in order to qualify for extra credit, participants were required to complete all items of each measure. The demographic questionnaire featured questions concerning participants' age, academic class, GPA, gender, race/ethnicity, religious/spiritual orientation. Because the construct of mindfulness was originally extracted from Buddhist meditative practices and previous studies have found greater levels of mindfulness among practicing Buddhists (Neff, 2003), additional items assessing the religious/spiritual orientation of each of the participants' parents were included to more accurately control for religious influences in participants. Informed consent, along with a general introduction of the study were presented before access to the questionnaires was granted.

Measures

The Experiences in Close Relationships-Revised Questionnaire (ECR-R; Fraley, Waller, & Brennan, 2000). The ECR-R is a 36-item self-report assessment of adult attachment developed from item response theory. Two 18-item subscales represent two orthogonal dimensions which are hypothesized to underlie the attachment construct: attachment-related anxiety and attachment-related avoidance. Items are rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A sample item that loads onto the attachment-related avoidance subscale reads, “I find it difficult to allow myself to depend on romantic partners.” Likewise, a sample item that loads onto the attachment-related anxiety subscale reads, “I often worry that my partner doesn’t really love me.” Following the re-keying of reverse-scored items, subscale scores are obtained by calculating the average of all 18 responses. The ECR-R demonstrated robust psychometric properties; in its initial validation study using a sample of undergraduate students, internal consistency for the two factors was excellent ($\alpha=.93$ for attachment anxiety and $\alpha=.95$ for attachment avoidance). Internal consistency for the two factors in the present study were estimated at .94 (anxiety) and .94 (avoidance). Subsequent analyses support not only the two-factor structure, but the convergent and discriminant validity as well (Fairchild & Finney, 2006).

Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987).

The IPPA is a 35-item self-report questionnaire that evaluates different measures of attachment quality between participants and their mother, father, and peers. Items on the questionnaire load onto three factors: degree of mutual trust (10 items; e.g., “I trust my mother/father”), quality of communication (9 items; e.g., “My father helps me to talk

about my difficulties.”), and prevalence of anger toward and alienation from mothers and fathers (6 items; e.g., “I get upset easily around my mother”). Items are rated on a 5-point scale ranging from 1 (*Almost Never or Never True*) to 5 (*Almost Always or Always True*). The three IPPA scale scores are summed up to create an overall attachment score; the alienation subscale is reverse scored before it is added to the trust and communication subscales. High overall scores on the IPPA indicate positive qualities of attachment. Reliability and construct validity of the IPPA are well established. Three week test-retest reliabilities for a sample of 18-20 year old college students were .93 for parent attachment and .86 for peer attachment; parental attachment scores were also positively related to measures of positive family and inversely related to depression and loneliness (Armsden & Greenberg, 1987). In the present study, Cronbach’s alpha for each of the three subscales was estimated at .89 (Mother), .88 (Father), and .80 (Peer). Last, scores on the IPPA were not found to be significantly related to socio-economic status and only negligibly related to parents’ education levels (Armsden & Greenberg, 1987).

Dialectical Self Scale (DSS; Spencer-Rodgers et al., 2004). The DSS is a 32-item self-report measure that assesses three factors of dialectical thinking (contradiction, cognitive change, behavioral change) in the domain of self-perception. Contradiction and cognitive/behavioral change are assessed across three realms: psychological (13 items; e.g., “I am constantly changing and am different from one time to the next”), environmental (12 items; e.g., “My world is full of contradictions that cannot be resolved”), and interpersonal (7 items; e.g., “I find that my values and beliefs will change depending on who I am with”). Items are rated on a 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). DSS scores range from 32 to 244; higher scores

indicate a greater capacity for dialectical thinking as it applies to the domain of self-perception. Previous research on a sample of college students in both America and China indicates that DSS scores possess acceptable reliability (Cronbach's alpha scores ranged from .71 to .86; .75 for the current study) as well as convergent validity (DSS scores correlated with acknowledgment and acceptance of contradictions in self-construals and health beliefs) (Hou, Zhu, & Peng, 2003; Spencer-Rodgers et al., 2004).

Social Paradigm Belief Inventory (SPBI; Kramer et al., 1992). The SPBI is a 56-item self-report questionnaire assessing four belief paradigms about the social world: formistic (14 items; e.g., "There is a right person for everyone. This is because some people just belong together since they have the same type of personality and as a result are perfectly compatible"), mechanistic (14 items; e.g., "Experience tells you whether you can work with someone. This is because over time you'll discover whether your work experiences with that person are rewarding or not."), relativistic (14 items; e.g., "Change comes from the inside. It comes from a change of outlook on things; no matter what happens on the outside you can always alter your view of things and you will be different"), and dialectical (14 items; e.g., "Change comes neither from the inside nor the outside. It comes from an interaction of natural changes the person goes through with changes in the environment and how these changes are seen by the person"). Items are rated on a 6-point scale, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The four SPBI subscales measure each of the four aforementioned social paradigm belief systems; subscale scores range from 14 to 84; higher scores indicate a greater endorsement of the measured belief system. The SPBI demonstrated acceptable reliability, with test-retest scores (over a 2-week interval) ranging from .77 to .82

(Kramer et al., 1992). Initial validation studies were conducted on a sample of college students, a sample of community-residing adolescents and adults, and a sample of college alumni. In addition, the SPBI also demonstrated both convergent and discriminant validity; it correlated with other paradigm belief scales and was unrelated to measures of personality, verbal intelligence, and social desirability (Kramer et al., 1992). For the present study, Cronbach's alpha for the 14-item SPBI-Dialectical subscale was estimated at .67. Follow up analysis was conducted to investigate whether the removal of individual items would significantly increase the reliability score. However, no such item could be identified.

Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The MAAS is a unidimensional 15-item self-report measure of the presence or absence of attention to and awareness of what is occurring in the present. The scale intentionally focuses on the attentional components of mindfulness (what the authors considered to be foundational to the construct), rather than on other attributes such as acceptance and empathy (Brown & Ryan, 2003). A sample item on the scale reads, "I find myself listening to someone with one ear, doing something else at the same time." Items are rated on a 6-point scale, ranging from 1 (*almost always*) to 6 (*almost never*). MAAS scores range from 15 to 90; higher scores indicate a greater endorsement of mindful attention and awareness. In its initial series of validation studies (using a sample of college students as well as a general adult sample), Brown and Ryan (2003) reported a test-retest correlation of .81 over a 4-week period, evidence of convergent validity (the MAAS correlated with emotional intelligence, NEO-PI Openness to Experience, and clarity of emotional states), and evidence of discriminant validity (the MAAS did not correlate with private self-

consciousness, self-monitoring, and reflection). A separate study examining variance in the MAAS across adult attachment styles reported internal consistency reliability scores of .84 for securely attached participants and .81 for insecurely attached participants (Condon & Finney, 2008). For the current study, reliability was estimated at .89.

Self-Compassion Scale (SCS; Neff, 2003). The SCS is a 26-item self-report questionnaire that assesses six different aspects of self-compassion (some of which are reverse-keyed): Self-Kindness (“I try to be understanding and patient towards those aspects of my personality I don’t like”), Self-Judgment (“When I see aspects of myself that I don’t like, I get down on myself”), Common Humanity (“I try to see my failings as part of the human condition”), Isolation (“When I fail at something that’s important to me, I tend to feel alone in my failure”), Mindfulness (“When something upsets me I try to keep my emotions in balance”), and Over-Identification (“When something painful happens I tend to blow the incident out of proportion”). Items are rated on a 5-point scale, ranging from 1 (*almost never*) to 5 (*almost always*). Higher scores indicate higher levels of self-compassion (after the Self-Judgment, Isolation, and Over-Identification subscales are reverse-keyed). Preliminary evidence suggests that the scale has adequate psychometric properties. In its initial set of validation studies which used a sample of college students, Neff (2003) reported that SCS scores demonstrated internal consistency coefficients ranging from .80-.92 (.85 for the current study), discriminant validity with scores on independent measures of self-esteem, self-acceptance, and narcissism, and convergent validity (i.e., significant negative correlations) with scores on measures of rumination, thought suppression, depression, and anxiety.

Toronto Mindfulness Scale (TMS; Lau et al., 2006). The TMS is a 13-item self-report questionnaire that assesses mindfulness as a state-like (not trait-like) quality. The items load onto two factors, Curiosity (a quality of nonelaborative attention characterized by curiosity, acceptance, and openness to experience) and Decentering (awareness of one's experience with some distance and disidentification rather than being carried away by one's thoughts and feelings). Scores from both subscales may be totaled to create an overall score. A sample item loading onto the Decentering factor reads, "I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant." Items are rated on a 5-point scale according to the degree that the participant agreed with each statement, ranging from 0 (not at all) to 4 (very much). Higher scores on the TMS indicate greater state mindfulness. In its initial series of validation studies with a general adult sample, the TMS demonstrated high internal consistency with an alpha coefficient of .95 (.80 for the current study), evidence of convergent validity (the TMS positively correlated with reflective self-awareness and openness to experience), and evidence of discriminant validity (the TMS did not correlate with ruminative self-focused attention, self-consciousness, and social desirability). Furthermore, the TMS was able to discriminate between various levels of mindfulness meditation experience (Lau et al., 2006).

Data Analysis

The software package, AMOS (version 17.0), was used to conduct the SEM analyses. Figure 2 provides a graphical representation of the full structural regression model for this study. According to this model, dialectical thinking was hypothesized to partially mediate the contribution of attachment security to mindfulness. In addition to

this core structural regression model, an alternative model was tested in hopes of providing further support for the core model. This alternative model investigated attachment security as a construct which mediates the contribution of dialectical thinking on mindfulness (see Figure 3). It was hoped that the comparative testing of the core and alternative models might bring greater clarity concerning the unique and indirect contributions of social/relational (i.e., attachment security) and cognitive (i.e., dialectical thinking) factors on individual differences in mindfulness-based competencies. Said differently, this comparative analysis may help determine if people are more mindful because they are more securely attached or if people are more mindful because they are more cognitively flexible.

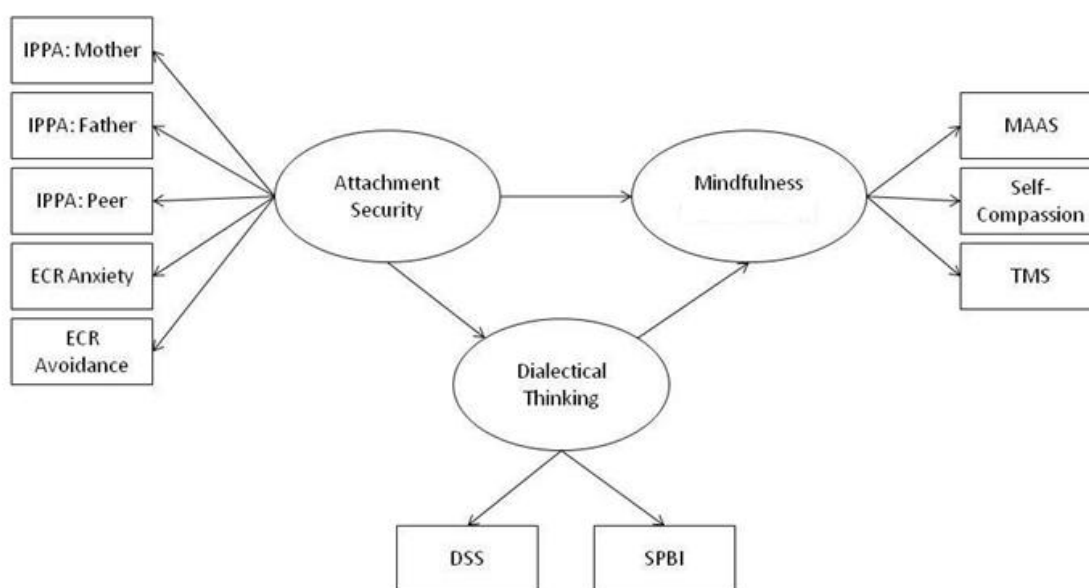


Figure 2. The Research Model of Attachment Security, Dialectical Thinking, and Mindfulness.

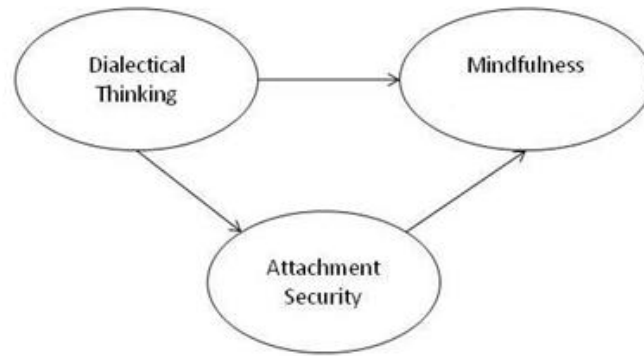


Figure 3. Alternative theoretical Model of Attachment Security, Dialectical Thinking, and Mindfulness.

To ensure that the proposed structural regression model was properly identified and estimated, the measurement model of the proposed structural regression model was first evaluated prior to the structural model, as indicated by Bollen's (1989) two-step rule and Anderson and Gerbing's (1988) two-step approach to modeling. Accordingly, the structural regression (SR) model was first re-specified as a confirmatory factor analysis (CFA) model. Should the CFA model demonstrate reasonable fit (specific metrics determining reasonable fit will be presented shortly), the overall fit of the core SR model will then be assessed.

To test whether an indirect effects-only model provided a better description of the data than the hypothesized model, several steps were taken. First, a model containing only the direct effect of the predictor variable (attachment security) on the criterion variable (mindfulness) was evaluated. After verifying that this direct effect model adequately fit the data, the fit of the core SR model (with all three latent variables) was then assessed. After verifying that the core SR model adequately fit the data, the core SR model (with all direct and indirect effects being freely estimated) was then be compared to an alternative SR model (i.e., the core model with the direct effect of the independent variable on the dependent variable being constrained to zero) using the chi-square

difference test. Finally, the significance of the indirect effect was tested via the Delta method of assessing indirect effects (Sobel, 1982).

Following the recommendations of Schumacker and Lomax (2004), a variety of global fit indices were used to test the proposed model. These included the chi-square statistic, the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990), which should be less than .05 to declare excellent fit, the Comparative Fit Index (CFI; Bentler, 1990), which should be greater than 0.95, and the Normed Fit Index (NFI; Bentler & Bonett, 1980), which should be greater than 0.95. In addition to the global fit indices, additional steps were taken to further evaluate the fit of the proposed model to the observed data. These steps included an examination of the standardized residual covariances (which should be between -2.00 and 2.00), an inspection of the parameter estimates for the presence of Heywood cases, and a careful review of the modification indices for theoretically-defensible modifications to the model that will improve statistical fit. The statistical model was estimated via the maximum-likelihood estimation method.

Missing data were expected to be minimal for most variables, as the settings of the online survey website required participants to complete all items (participants will be unable to progress to the next page if any unanswered items exist in the current page). In addition, outlier analyses were undertaken prior to all major statistical analyses. Identified outliers were also checked for coding errors. In addition, violations of statistical assumptions such as multivariate normality and linearity were also checked.

As noted earlier, the total sample size for this study was 284, which was expected to provide acceptable statistical power to carry out the planned analyses. Notably, the

sample size comfortably exceeded the minimum 100 sample size limit established by Kline (2005) as well as the minimum 10:1 ratio of subjects-to-freely estimated parameters set by Jackson (2003). Given that the most complex model tested in this study contained a total of 14 freely estimated parameters, the ratio of subjects-to-freely estimated parameters for the current study stood at over 20:1.

Chapter 4: Results

Descriptive statistics for all the measured variables are presented in Table 3.

Inter-correlations among the measured variables are provided in Table 4. With the exception of one indicator (the Toronto Mindfulness Scale), moderate to large intercorrelations between the proposed indicators provided support for the formation of latent constructs from multiple indicators for attachment security ($r_s = .30-.55$), dialectical thinking ($r_s = .23$), and mindfulness ($r_s = .50$). In addition, correlations among indicators of different latent constructs were moderate and often significant ($r_s = -.16$ to $-.37$; $r_s = -.13$ to $-.33$), providing preliminary support for the proposed meditational paths. Notably, although the two latent constructs appeared to be significantly related, the correlation between dialectical thinking and mindfulness was negative, which was opposite of what was originally hypothesized.

Table 3
Descriptive Statistics for the Measured Variables

Variable	<i>M</i>	<i>SD</i>	Possible range	Actual range
Experiences in Close Relationships - Anxiety	57.86	22.84	18-126	18-118
Experiences in Close Relationships – Avoidance	51.64	20.08	18-126	18-106
Inventory of Parent and Peer Attachment – Mother	88.58	21.59	35-175	63-155
Inventory of Parent and Peer Attachment – Father	75.14	23.99	35-175	55-155
Inventory of Parent and Peer Attachment – Peer	86.20	13.81	35-175	68-144
Dialectical Self Scale	113.89	18.95	32-244	85-159
Social Paradigm and Beliefs Inventory	59.13	7.13	14-84	38-79
Mindfulness Attention and Awareness Scale	57.59	12.33	15-90	24-90
Self-Compassion Scale	69.58	17.55	26-130	50-118
Toronto Mindfulness Scale	32.65	7.83	0-52	5-49

Table 4
Correlations Among the Measured Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. ECR–Anxiety	—	.55**	-.33**	-.37**	-.30**	.43**	.18**	-.40**	-.48**	.07
2. ECR–Avoidance		—	-.31**	-.35**	-.36**	.36**	.05	-.31**	-.36**	-.11
3. IPPA–Mother			—	.43**	.25**	-.37**	-.16**	.27**	.30**	.06
4. IPPA–Father				—	.33**	-.30**	-.09	.19**	.37**	.07
5. IPPA–Peer					—	-.31**	.08	.18**	.25**	.20**
6. DSS						—	.23**	-.33**	-.38**	.01
7. SPBI							—	-.13*	.08	.21**
8. MAAS								—	.50**	-.14*
9. SCS									—	.05
10. TMS										—

* $p < .05$. ** $p < .01$.

Data Screening

The first step of the data screening process involved a screening for missing values and incorrectly entered data. Because the SONA online interface was set to require all participants to complete all items, no missing data was found in the dataset. For all indices, ranges of observed scores were compared to ranges of possible scores to check for incorrectly entered data. All observed ranges were found to be within valid thresholds.

The data were then screened for blatant and careless response patterns (e.g., all answers marked as “1”) and unusually low survey duration times. Although the expected completion time of the surveys was approximately 60 minutes, a small group of participants (approximately 20 of the original 300 total participants) completed all the surveys in less than 20 minutes. The response sets of these individuals were carefully scrutinized on a case-by-case basis. Among them, 15 problematic cases were identified and removed where a blatant response pattern was recognized. This group represented 5% of the total sample.

Next, all indices were checked for univariate outliers. During the process, one case was identified as an outlier on three separate indices (this individual also completed all the surveys in 17 minutes). Another case was identified as an outlier for seven subscales across all three latent variables measured in this study. Both cases were removed. To screen for multivariate outliers, mahalanobis distances were calculated for all subscales within each scale as well as indices with both theoretical and observed correlations. Instances where the critical value was exceeded were individuals were carefully examined. One response set was identified as an outlier on more than one multivariate relationship and was removed. This case was removed, bringing the total of removed cases to 18 (6% of the original sample of 300 participants).

The data were also examined for violations of statistical assumptions applicable to structural equation modeling. First, to check for violations of univariate normality, histograms for each of the indices were reviewed and found to display adequate-to-excellent fit. Skewness and kurtosis values were also calculated and no value was observed to surpass +1 or -1. In addition, several residuals plots were created from regression models that included indices from two of the three latent variables examined in this study; no observed skewness or kurtosis values exceeded -.30 or .30. Kolmogorov-Smirnov and Shapiro-Wilk tests were not significant (suggesting normality) for all indices except the ECR-Anxiety (Sig. = .001), ECR-Avoidance (Sig. = .004), IPPA Mother Total Score (Sig. = .000), and IPPA Peer Total Score (Sig. = .001) subscales. It is important to note that the normality tests used above are known to be quite sensitive when the sample size is large (Hair, Anderson, Tatham, & Black, 1998, p. 73). Last, because tests for multivariate normality violations are difficult to access (e.g., Mardia's

coefficient is not available in SPSS), have been found to be overly sensitive, and are generally not widely implemented, multivariate normality was not checked in this present study.

Intercorrelations between the proposed indicators were examined for multicollinearity. High multicollinearity (i.e., correlations that exceed .80) was absent; the greatest observed correlation was .55 between the ECR-Anxiety and ECR-Avoidance subscales. Variance Inflation Factor (VIF) statistics from regression models that included indices from two of the three latent variables examined in this study were also examined to check for statistical violations relating to multicollinearity and/or singularity (i.e., that no variables are a perfect linear combination of two or more of the other variables); no observed VIF statistic exceeded 1.9, suggesting that multicollinearity/singularity is not a concern with this dataset.

The data were then checked for violations of linearity, independence of residuals, and homoscedasticity. To test for linearity (i.e., that the relationships between variables fit best into a straight line when plotted on a graph), several bivariate scatter plots were examined for linear fit. An oval or elliptical shape was observed across all scatter plots, indicating that the linearity assumption was not violated. Residuals plots were examined and generally revealed only small departures from a straight line and no “S” shaped curves or patterns were observed, suggesting that the residuals are independent. Furthermore, clusters of points are generally of similar width throughout each of the residuals plots, suggesting that the relationships between variables are homoscedastic.

Last, the covariance matrix was examined to see if it was ill-scaled (i.e., if the ratio of the largest to the smallest variance is greater than 10). The variable with the

largest variance was the IPPA Father Subscale (575.736), which exceeded 10 times the variance of the SPBI (50.77) and the TMS (61.270). To compensate, SPBI and TMS scores were multiplied by two. As a result, the updated ratios for the two scales (SPBI: 2.84, TMS: 2.35) were within normal limits.

Model Testing Procedures

Following Bollen's (1989) two-step rule and Anderson and Gerbing's (1988) two-step approach to modeling, a measurement model was specified and tested as a first step. The initial measurement model (see Figure 4) consisted only of unidirectional paths between latent variables and their corresponding manifest indicators, with bidirectional correlations between the latent variables. This model produced significant factor loadings for all manifest variables on their respective latent constructs except one (Toronto Mindfulness Scale: standardized regression weight=.010, $p=.881$) and did not show acceptable fit to the data, $\chi^2 (32, N = 284) = 100.24, p = .000$, CFI = .888, NFI = .847, RMSEA = .087 (Left C.I. = .068; Upper C.I. = .106).

No improper parameter estimates (i.e., Heywood cases) were found (no negative error variances, no standardized factor loadings greater than 1.0 or less than -1.0). Several modification indices were reported by the AMOS software, from which two were theoretically justifiable: correlating the measurement errors associated with the two ECR subscales (ECR Anxiety and ECR Avoidance) and correlating the measurement errors associated with the IPPA Mother and IPPA Father subscales (these subscales contained the exact same items, applied to different parents). After examining the standardized residuals for elements that are not well explained by the specific model, it was found that the Toronto Mindfulness Scale significantly underexplained both the SPBI (standardized

residual = 3.483) while significantly overexplaining MAAS (standardized residual = - 2.320). Together with the fact that the Toronto Mindfulness Scale did not significantly load onto the Mindfulness latent variable and was not strongly correlated with the other mindfulness-related measures, a decision was made to remove this manifest indicator from the research model.

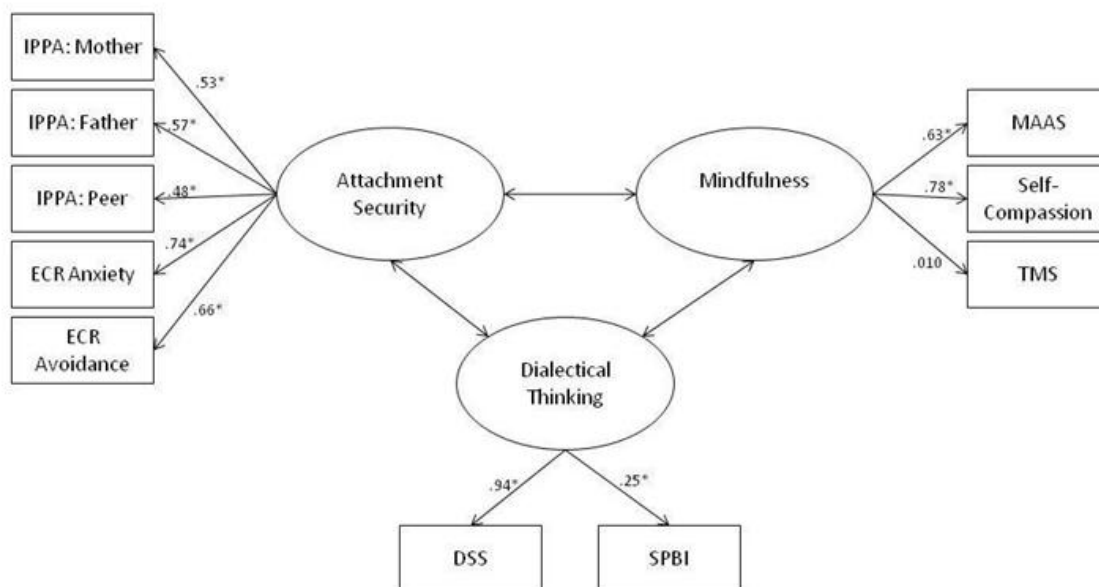


Figure 4. Initial Measurement Model of Attachment Security, Dialectical Thinking, and Mindfulness (standardized coefficients displayed). * $p < .05$.

The revised measurement model (see Figure 5) was then comprised of the original model with two additional measurement error covariances and with the Toronto Mindfulness Scale removed. This model produced significant factor loadings for all manifest variables on their respective latent constructs and demonstrated acceptable fit to the data, $\chi^2 (22, N = 284) = 40.65, p = .009$, CFI = .968, NFI = .934, RMSEA = .055 (Left C.I. = .027; Upper C.I. = .081). Again, no improper parameter estimates (i.e., Heywood cases) were found in this revised model. Only a few modification indices were reported by the AMOS software, out of which none were theoretically justifiable to implement.

After examining the standardized residuals for elements that are not well explained by the specific model, no problematic elements were found.

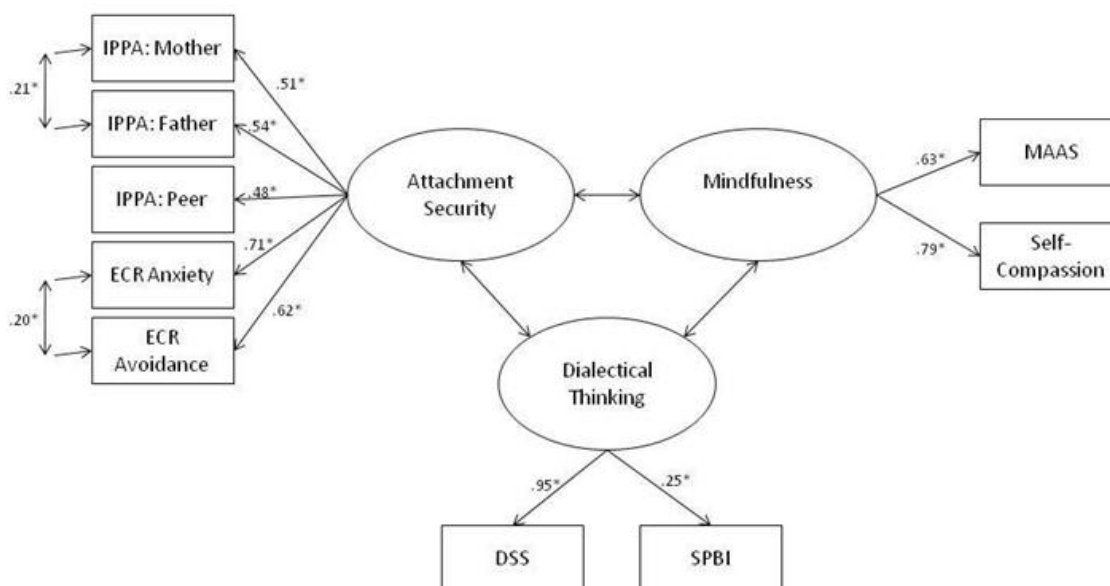


Figure 5. Revised Measurement Model of Attachment Security, Dialectical Thinking, and Mindfulness (standardized coefficients displayed). * $p < .05$.

In light of the favorable results of the revised measurement model, model testing continued with an examination of the direct relation between the predictor variable (attachment security) and the criterion variable (mindfulness; see Figure 6). This model produced a good fit to the data, $\chi^2(11, N = 284) = 18.02, p = .081$, CFI = .985, NFI = .962, RMSEA = .047 (Left C.I. = .000; Upper C.I. = .086), with a significant, positive path coefficient between the predictor and criterion variables ($\beta = .78$). The significance of this path suggested that there was a positive, direct effect between attachment security and mindfulness ($R^2 = .33$).

Because the direct relation between the predictor variable and the criterion variable was significant, a full model (see Figure 7) was tested that included both the direct effect of attachment security on mindfulness as well as its indirect effect (mediated by dialectical thinking) on the outcome. The full model provided acceptable fit to the

data, $\chi^2 (22, N = 284) = 40.65, p = .009$, CFI = .968, NFI = .934, RMSEA = .055 (Left C.I. = .027; Upper C.I. = .081), and indicated that the direct effect between the predictor and criterion variables remained statistically significant and unchanged ($\beta = .78$).

Furthermore, the indirect effect between attachment security and dialectical thinking (mediated by dialectical thinking) was not significant.

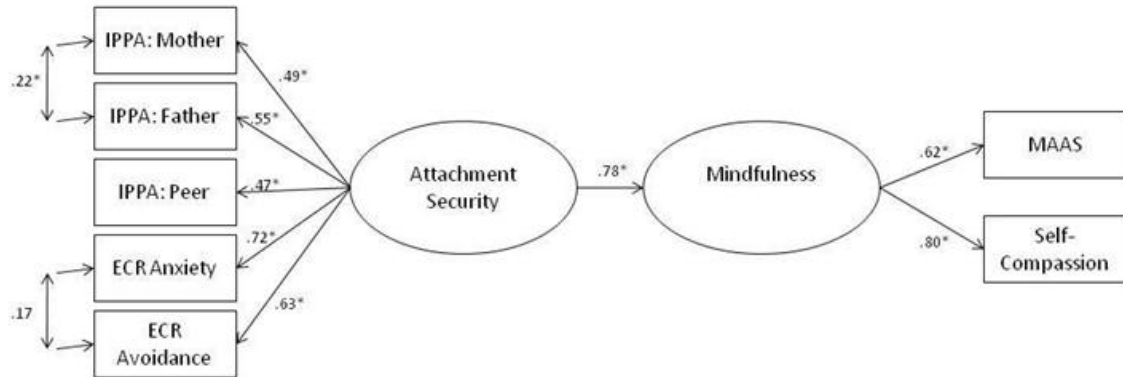


Figure 6. Direct Relation Model of Attachment Security and Mindfulness (standardized coefficients displayed). * $p < .05$.

Next, the full model was then respecified to test for the indirect contributions of attachment security on mindfulness. In this respecified model, the direct path between the predictor variable (attachment security) and the criterion variable (mindfulness) was constrained to zero (see Figure 8). This model also yielded acceptable fit to the data, $\chi^2 (23, N = 284) = 47.48, p = .002$, CFI = .958, NFI = .923, RMSEA = .061 (Left C.I. = .036; Upper C.I. = .086). However, this indirect effects-only model showed significantly worse fit to the data compared to the full model ($\Delta \chi^2 (1, N = 284) = 6.83, p = .01$) and was therefore not retained as the final model. Substantively, this result suggests that the direct path included in the full model was significantly different from zero and therefore can be concluded to be a necessary path. Taken together, these results indicate that the relationship between attachment security and mindfulness is not mediated by dialectical thinking.

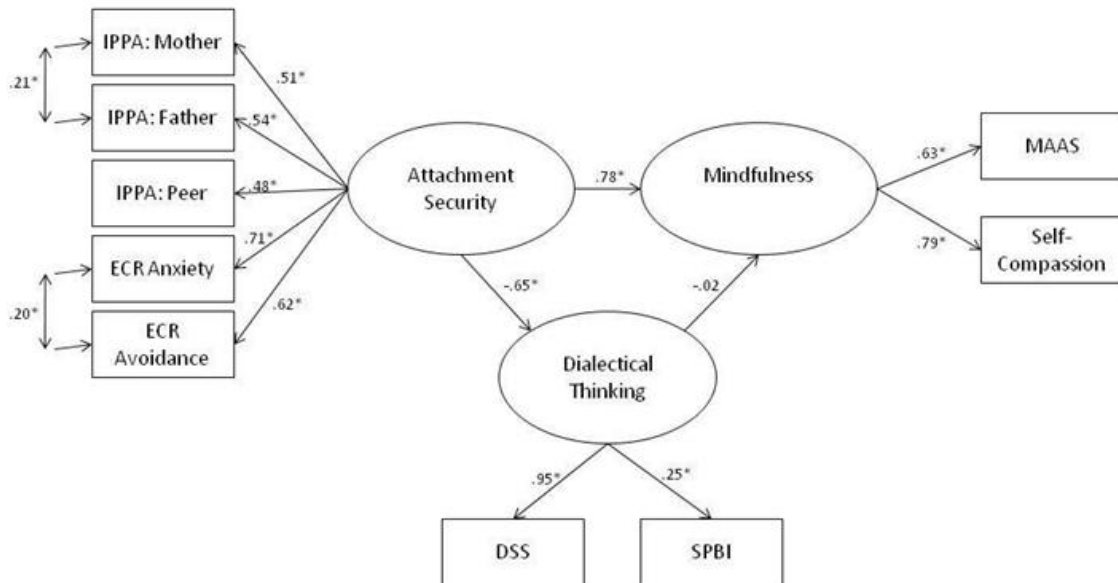


Figure 7. Full Model of Attachment Security, Dialectical Thinking, and Mindfulness (standardized coefficients displayed). $*p < .05$.

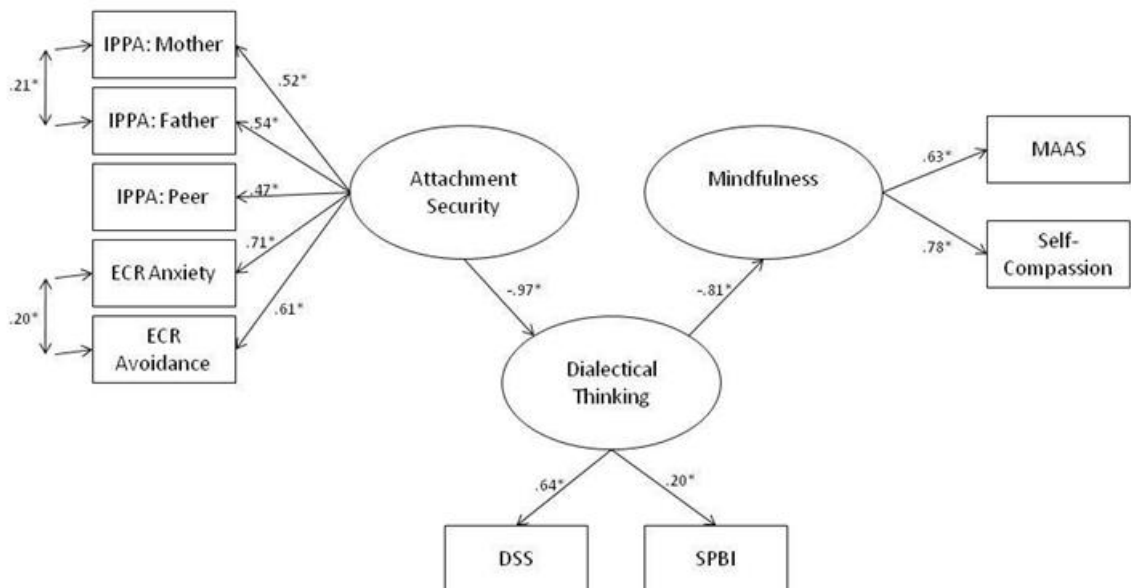


Figure 8. Mediation Model of Attachment Security, Dialectical Thinking, and Mindfulness (standardized coefficients displayed). $*p < .05$.

Seeing that the original model did not yield a significant mediation relationship, an alternative model—one with dialectical thinking as predictor variable, mindfulness as criterion variable, and attachment security as mediator—was then tested. Following the same sequence of mediation model testing that was applied to the original model, the

direct relation between the new predictor variable (dialectical thinking) and criterion variable (mindfulness) was first examined (see Figure 9) and found to be of excellent fit to the data, $\chi^2 (1, N = 284) = 1.24, p = .27$, CFI = .998, NFI = .992, RMSEA = .029 (Left C.I. = .000; Upper C.I. = .164), with a significant, negative path coefficient between the predictor and criterion variables ($\beta = -.54$).

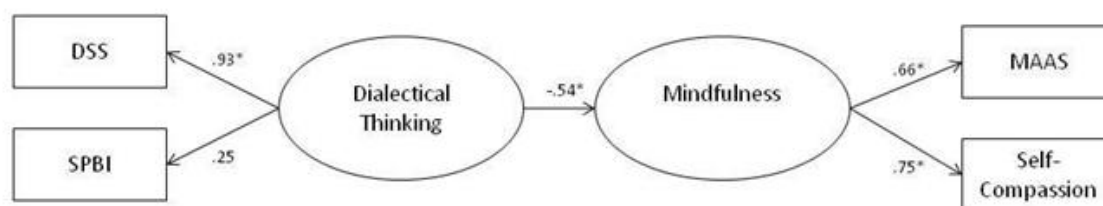


Figure 9. Direct Relation Model of Dialectical and Mindfulness (standardized coefficients displayed). * $p < .05$.

Because the direct relation between the predictor variable and criterion variable was significant, the full alternative model (see Figure 10) was tested. This model included both the direct path between the two constructs as well as the indirect path between the two constructs via the mediator (attachment security). The full model provided acceptable fit to the data, $\chi^2 (22, N = 284) = 40.65, p = .009$, CFI = .968, NFI = .934, RMSEA = .055 (Left C.I. = .027; Upper C.I. = .081), and indicated that the direct effect between the predictor and criterion variables was reduced to a value that was no longer significant ($\beta = -.020$). All other path coefficients were significant.

The full model was then respecified to test for mediation, with the direct path between the predictor variable (dialectical thinking) and the criterion variable (mindfulness) constrained to zero (see Figure 11). The model yielded acceptable fit to the data, $\chi^2 (23, N = 284) = 40.684, p = .013$, CFI = .969, NFI = .934, RMSEA = .052 (Left C.I. = .024; Upper C.I. = .078), and suggested that individuals who view the world and themselves from a dialectical perspective tended to be insecurely attached, which, in

turn, was associated with lower levels of mindfulness. Results also indicated that the indirect effect between dialectical thinking, attachment security, and mindfulness was statistically significant (indirect effect = $-.52$, Sobel test = -2.296 , Std. Error = $.094$, $p = .022$).

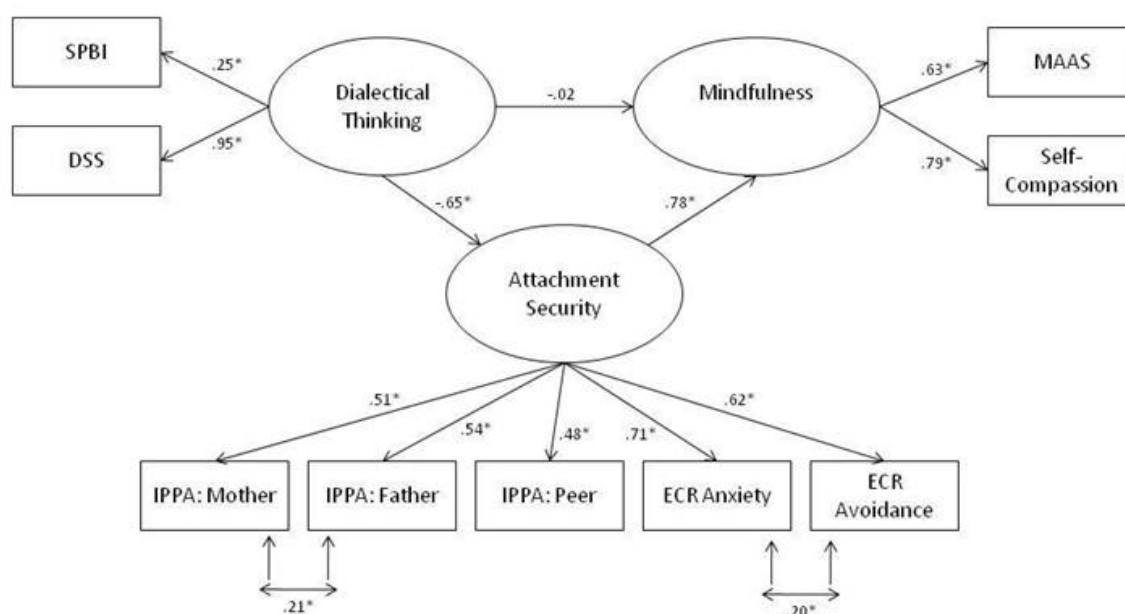


Figure 10. Full Alternative Model of Dialectical Thinking, Attachment Security, and Mindfulness (standardized coefficients displayed). * $p < .05$.

As a final step to test for mediation, the chi-square value of the mediation model was compared to the chi-square of the full model. The chi-square value of the mediation model was not significantly different from the chi-square value of the full model $\chi^2(1, N = 284) = -0.034$, which indicates that the direct path included in the full model was not significantly different from zero. As a result, it can be deduced that the direct path was not a necessary path. Therefore, the alternative mediation model (i.e., the indirect effects-only model with dialectical thinking as the predictor variable, mindfulness as the criterion variable, and attachment security as mediator) became the final model examined in this study. Taken together, these results offer preliminary support to the assertion that

the relationship between dialectical thinking and mindfulness is mediated by attachment security.

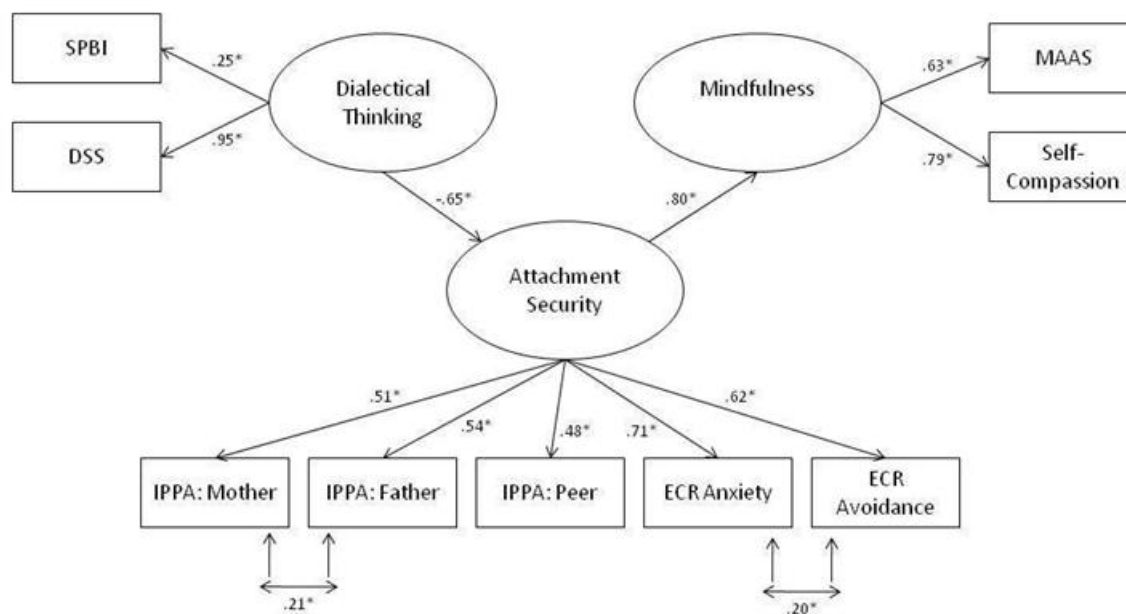


Figure 11. Mediation Model of Dialectical Thinking, Attachment Security, and Mindfulness (standardized coefficients displayed). * $p < .05$.

Chapter 5: Discussion

The present study examined the relationships between three latent constructs: attachment security, dialectical thinking, and mindfulness. Previous research had theoretically (Shaver, Lavy, Saron, & Mikulincer, 2007; Ryan, Brown, and Creswell, 2007) and empirically (Bouchard et al., 2008; Cordon & Finney, 2008; Walsh et al., 2008) established the interrelatedness between attachment security and mindfulness. Results of a structural equation model that examined the direct effects of attachment security on mindfulness confirmed this relationship, indicating that individuals who were securely-attached also tended to exhibit a greater disposition towards mindfulness. Notably, the amount of variance accounted for was $R^2 = .61$, $p < .001$ (see Figure 6), suggesting that attachment security may indeed represent a critical social condition that supports the development of dispositional elements of mindfulness (Brown & Ryan, 2003).

As attachment security accounted for over half of the observed variance of mindfulness in our sample, the current investigation explored whether this relationship was mediated in part by a third construct—dialectical thinking. Previous research on dialectical thinking and its implications on mental health have produced mixed results, with researchers observing links between dialectical thinking and both adaptive (Cheng, 2009) as well as maladaptive (Spencer-Rodgers et al., 2004) constructs of psychological well-being. Although little to no empirical research had specifically examined the relationship between dialectical thinking and either attachment security or mindfulness, the preliminary hypothesis (which was primarily based on the theoretical relationships between the constructs) was advanced that dialectical thinking may in fact be positively

correlated to both. This unfortunately did not turn out to be the case, as dialectical thinking was found to be significantly, though negatively related to both attachment security as well as mindfulness.

One way to understand this negative correlation between dialectical thinking and attachment security is to consider the possibility that dialectical thinking, as it is applied to the domain of self-perception, might resemble the defense mechanism known to Kernberg (1984) as splitting. Splitting refers to a form of self-concept fragmentation whereby one simultaneously possesses two opposing cognitive representations of the self—such that one representation is almost exclusively positive and the other representation is almost exclusively negative (Myers & Zeigler-Hill, 2008). Although individuals who frequently engage in splitting may appear to endorse a dialectical perspective of the self because they simultaneously affirm seemingly contradictory views of the self, such dialecticalism lacks integration and synthesis between the two views and is therefore unrelated to the dialectical thinking that is associated with cognitive flexibility, problem-solving, identity formation and resolution, and cognitive development (Kramer, 1990).

In fact, a careful reexamination of several items in the Dialectical Self Scale (Spencer-Rodgers et al., 2004) suggests that participants may have answered certain items affirmatively without necessarily possessing a synthesized or integrated view of their seemingly-contradictory beliefs. Some examples include, “My world is full of contradictions that cannot be resolved” and “I sometimes believe two things that contradict each other.” If this is indeed the case, it would not be surprising then to find that this construct turned out to be strongly negatively correlated with attachment

security; for secure attachment represents a set of integrated and coherent cognitive representations (i.e., internal working models) of the self and others based on trust and communication (Ryan et al., 2007).

Similarly, the observed negative relationship between dialectical thinking and mindfulness can be understood in view of the antithetical relationship between splitting and mindfulness. For example, poorly integrated dialecticalism, as it is applied to one's perceptions of others (as opposed to the self), will tend to create instability in relationships because the other person can be viewed as either all good or all bad at different times. Rather than mindfully and non-judgmentally attending to the present (and often paradoxical) realities of others, the splitting personality will impose rigid and over-generalized interpretations concerning other people's motives, intentions, and character. This relational dynamic is perhaps most keenly illustrated by the emotional dysregulation and interpersonal instability commonly observed among individuals diagnosed with borderline personality disorder.

For this specific population, Linehan (1993) developed a unique therapy modality (i.e., Dialectical Behavior Therapy) that included mindfulness-based interventions and drew heavily upon insights from a well-integrated dialectical perspective of human change and behavior that sought to find "wisdom within contradictions" (p. 32). Linehan (1993) explained:

From the dialectical perspective, however, conflict that is maintained is a dialectical failure. Instead of synthesis and transcendence, in the conflict typical of borderline individuals there is opposition between firmly rooted but contradictory positions, wishes, points of view, and so on. The

resolution of conflict requires first the recognition of the polarities and then the ability to rise above them, so to speak, seeing the apparently paradoxical reality of both and neither. (p. 36)

From what we can see here, the dialectical perspective of Linehan does not stop at the mere endorsement of contradictory positions (to her, doing so was understood to be the cause of the core inner conflict for the borderline patient) but instead pushes forward towards the synthesis, resolution, or transcendence of that contradiction. The mindfulness-based interventions within Dialectical Behavior Therapy could then be understood as a mechanism to facilitate the synthesis or integration of one's fragmented views of others. Said differently, it is a mechanism to help people become more open to the paradoxical nature of reality.

Even though dialectical thinking was unexpectedly found to be negatively correlated with both attachment security and mindfulness, it was still plausible that dialectical thinking functioned as a mediator in the relationship between the two latter constructs. Results of structural equation modeling revealed, however, that dialectical thinking did not mediate the relationship between attachment security and mindfulness. Moreover, when the direct effect between attachment security and mindfulness was left unconstrained, the indirect effect of attachment security on mindfulness (via dialectical thinking) was not statistically significant. Only when the direct effect between attachment security and mindfulness was removed from the model did the indirect effect of attachment security on mindfulness (via dialectical thinking) become statistically significant. Together, these results indicated that the contribution of attachment security

to individual differences in mindfulness is not accounted for by the degree of one's endorsement of dialectical thinking.

An alternative structural equation model examined the influence of dialectical thinking on mindfulness using a mediational approach in which attachment orientation was investigated as a mediator of the dialectical thinking-mindfulness relationship. Initial results indicated that dialectical thinking was significantly and negatively related to mindfulness. When a full mediational model was tested, it was found that the dialectical thinking-mindfulness link was indeed significantly mediated by attachment security. Specifically, dialectical thinking contributes its negative effects on mindfulness through an individual's insecure attachment orientation. In addition, when left unconstrained, the direct effect between dialectical thinking and mindfulness was not statistically significant. The indirect effect between dialectical thinking and mindfulness (via attachment security), however, was statistically significant with a large effect size. Together, these results indicate that the contribution of dialectical thinking on the observed variance of mindfulness was in fact fully accounted for by the quality of one's attachment orientations.

Indeed, several implications can be gleaned from the results of this study. In response to Ryan and Brown's (2003) call for research into the psychological and social conditions that hinder and support the expression of mindfulness, this study has investigated the unique and shared contributions of attachment security and dialectical thinking on the dispositional expression of mindfulness. Notably, mindfulness-based therapeutic interventions typically fall within a cognitive-behavioral theoretical framework; within such contexts, the attentional component of mindfulness (i.e., the

quality of being acutely aware of current experience) is emphasized and is understood to play a key role in disengaging individuals from maladaptive automatic thoughts and habits (Brown & Ryan, 2003). This study is, to our knowledge, the first to examine the construct of mindfulness in view of both cognitively-oriented (i.e., dialectical thinking) as well as relationally-oriented (i.e., attachment security) precursors. Moreover, two different mediational models were tested side-by-side to investigate whether the relationally-oriented construct mediated the contribution of the cognitively-oriented construct on mindfulness—or vice versa.

Between these two mediational models, one model emerged as the preferred model. In the preferred model, not only did the relationally-oriented construct (i.e., attachment security) account for a greater amount of variance in mindfulness than the cognitively-oriented construct (i.e., dialectical thinking), but it also fully mediated the contribution of the latter construct on mindfulness. In line with the plethora of research that has linked attachment security with various measures of psychological well-being, including mindfulness (Cordon & Finney, 2008; Walsh et al., 2009), this study has demonstrated that a secure attachment orientation can fully mediate the potentially adverse effects of a cognitive orientation that may be associated with a fragmented or poorly-integrated self-concept. Indeed, these findings also lend further support to the theorizing of Shaver et al. (2007), who presented a case for the viability of attachment security as a social foundation for the development of mindfulness, suggesting that mindfulness should be placed within an attachment framework, thereby benefitting from its vast base of knowledge and research. In summary, the results of this study give

credence to a conceptualization of mindfulness as a construct that is rooted not only in one's attention and cognition, but also in one's interpersonal landscape.

With regard to implications for practice, as noted earlier, mindfulness-based interventions typically fall within a cognitive-behavioral therapy modality, such as Mindfulness-Based Cognitive Therapy (Teasdale et al., 1995) and Dialectical Behavior Therapy (Linehan, 1987). Under such contexts, mindfulness skills are believed to change behavior and reduce symptoms through the inhibition of avoidance, the modulation of problematic thought patterns such as splitting or all-or-nothing thinking, and improved self-observation and self-management (Baer, 2004). The results of this study suggest that mindfulness is a multi-dimensional construct—one that encompasses not only cognition and behavior, but also one's interpersonal (and intrapersonal) dispositions. In addition to its various cognitive and/or behavioral benefits, mindfulness skills can also significantly improve the quality of one's relationships. Because a secure attachment orientation is capable of mediating the potentially negative effects of a fragmented self-concept on one's disposition towards mindfulness, a thorough exploration of clients' interpersonal history (alongside assessments of clients' problematic cognitions and patterns of self-talk) may therefore be a potentially helpful and relevant activity to complete prior to and following the implementation of any mindfulness-related clinical intervention.

Limitations

Several limitations to this study require consideration, some of which stem from its reliance on self-report measures to operationalize the constructs under investigation as well as its cross-sectional and correlational design. Together, these characteristics limit the extent to which conclusions can be drawn concerning the relationships between

attachment security, dialectical thinking, and mindfulness. For one, the correlational design of the study does not permit any causal relationships to be interpreted between the study variables. Second, because data were collected at only one timepoint, no developmental conclusions can be extrapolated from the findings. The use of self-report questionnaires to measure the constructs of this study also potentially introduces a variety of response biases such as social desirability or haphazard answering. Although steps were taken to identify and remove blatant and problematic response sets, the threat of haphazard answering—especially among the questionnaires that were presented near the end of the study—persists.

In addition, the exclusively university-based college-aged sample may limit the generalizability of the findings, especially for populations who are older or less educated. In particular, the young age range of our sample may introduce challenges to the measurement of dialectical thinking in our study. Within a cognitive developmental framework, dialecticalism is often understood as a more mature and integrated framework for making sense of reality (Kramer, 1990). It may be the case that limitations stemming from a lack of life experience among our college-aged sample may have led participants to misinterpret items designed to measure dialectical thinking. For example, it is possible for participants to endorse seemingly-contradictory dialectical views, having not yet reached a point where these views have been adequately integrated or synthesized (an activity that very well may occur among these participants later in life). The difference between a fragmented, poorly-integrated self-concept or interpersonal schema and a coherent, well-integrated dialectical view of the self and others may be profound even though there may be similarities on the surface.

Along this same line of thinking, the possibility that the measures of dialectical thinking used in this study may have actually tapped into a construct resembling Kernberg's notion of splitting (i.e., a fragmented self-concept) poses a potential threat to the construct validity. Even so, it is debatable whether or not dialectical thinking and splitting should necessarily be theoretically incompatible constructs. One possibility is that they may be similar constructs interpreted differently by distinct cultures. Notably, the two constructs took shape out of two distinct cultures, with different sets of values, norms, and epistemologies. For example, the Western worldview largely assumes that individuals are uncomfortable with incongruity and contradiction while the Eastern view does not share this view (Spencer-Rodgers et al., 2004). It would therefore not be surprising that the notion of splitting would then be understood in maladaptive terms (and in turn, be negatively associated with psychological well-being) within a Western context while native dialecticalism is not within an Eastern context.

Concerning the various latent variable models tested in this study (including the original and alternative direct effects-only, indirect effects-only, and unconstrained models), one significant concern that emerged from the findings was that the final direct effects model (with dialectical thinking as predictor and mindfulness as criterion; see Figure 9) showed excellent fit to the data while the final indirect effects-only model (the direct effects model with the addition of attachment security as a mediator; see Figure 11) showed only acceptable fit to the data. The concern is that considering overall model fit as well as model parsimony, it is questionable whether the indirect effects-only model is the best option as the final model of this study.

One way to address this concern would be to consider the perspective that the data support two defensible final models. Namely, that it is plausible to deduce from the results two compatible, non-contradictory conclusions: (a) dialectical thinking has a significant direct effect on mindfulness, and (b) the significant direct effect of dialectical thinking on mindfulness is fully mediated by attachment security. Indeed, according to Holmbeck (1997), the former conclusion must first be established before the second conclusion can be tested. According to Holmbeck's (1997) suggested four-step approach to test for mediated effects using structural equation modeling, given a latent predictor variable (A), a hypothesized latent mediator variable (B), and a latent outcome variable (C), the first step would be to assess the fit of the direct effect ($A \rightarrow C$) model (Hoyle & Smith, 1994). If the direct effect model fits the data adequately, the investigator then tests the fit of the overall $A \rightarrow B \rightarrow C$ model (step 2), before subsequently examining whether the path coefficients of the ($A \rightarrow B$) and the ($B \rightarrow C$) paths in that model are statistically significant. The final step compares the fit of the overall $A \rightarrow B \rightarrow C$ model with the $A \rightarrow C$ path constrained and unconstrained. According to Holmbeck (1997), this entire process is analogous to the steps typically followed when testing for mediation in regression analysis: specifically, to establish a mediated effect using regression, (a) the predictor must be significantly associated with the hypothesized mediator, (b) the predictor must be significantly associated with the dependent measure, (c) the mediator must be significantly associated with the dependent variable, and (d) the impact of the predictor on the dependent measure is less after controlling for the mediator.

A potentially salient point raised by the discussion above concerns the purpose and intention behind Holmbeck's (1997) suggestion that researchers first test the direct

effect model (i.e., between the predictor and criterion latent variables) before testing the full model with the mediator variable. According to Holmbeck (1997), the reason for doing so is to test “whether the direct path between the predictor and criterion is significant and, if so, whether this previously significant direct pathway fails to improve the fit of the mediational model” (p. 603). What this suggests is that the purpose of including a direct effects model into the analysis is not to offer a competing, alternative model to the full mediational model, but rather to verify that certain underlying assumptions are met (i.e., that the model adequately fits the data and that the observed path coefficient is statistically significant).

Another approach that can be taken to address the concern that the direct effects-only model demonstrated better fit to the data compared to the full mediational model would be to follow an alternative statistical procedure to testing for mediation. Specifically, the statistical significance of mediation effects can also be tested via a procedure based on bootstrap methods (Mallinckrodt, Abraham, Wei, & Russell, 2006; Shrout & Bolger, 2002). Baron and Kenny (1986) proposed that each pair of variables in the three-variable system must be significantly correlated before such a procedure can be conducted. The bivariate correlations between each of the latent variables shown in Table 5 confirm that these pre-requisite conditions are met.

Table 5
Correlations Among Latent Variables for the Measurement Model

Variable	1	2	3
1. Attachment Security	—	-.65***	.79***
2. Dialectical Thinking		—	-.52***
3. Mindfulness			—

*** $p < .001$.

The present study used the AMOS software to create 1,000 bootstrap samples from the full alternative model (see Figure 10). The bootstrap samples were run with the bias-corrected percentile method to estimate the path coefficients. Point estimates of the magnitude of the indirect effect (i.e., the products of the path from the independent variable to the mediator and the path from the mediator to the dependent variable), together with the associated 95% confidence interval were also estimated through the same 1,000 bootstrap samples. According to this procedure, if the confidence interval excludes zero, then the indirect effect is considered statistically significant at the .05 level (Mallinckrodt et al., 2006; Shrout & Bolger, 2002). Results from the bootstrap analyses are shown in Table 6, which indicate that the confidence intervals for the indirect effect between dialectical thinking and mindfulness (via attachment security) excluded zero. Therefore, this mediation effect can be considered statistically significant. For the sake of completeness, bootstrap analyses were also conducted on the original mediational model (see Figure 7) to confirm the previous finding that dialectical thinking did not mediate the contributions of attachment security onto mindfulness. Results of this analysis are shown in Table 7, which indicate that the confidence intervals for the indirect effect between attachment security and mindfulness (via dialectical thinking) did not exclude zero. Therefore, this mediation effect cannot be considered statistically significant.

Table 6
Bootstrap Analysis of Alternative Mediation Structural Model, Magnitude, and Statistical Significance of Indirect Effects

Independent variable	Mediator variable	Dependent variable	β (standardized path coefficient and product)	<i>p</i>	SE	95% confidence interval for mean indirect effect ^a (lower and upper)
Dialectical Thinking	Attachment Security	Mindfulness	$-.65 \times .78 = -.51$.002	.219	-.1.162, -.265

Note. *N* = 283.

Table 7
Bootstrap Analysis of Original Mediation Structural Model, Magnitude, and Statistical Significance of Indirect Effects

Independent variable	Mediator variable	Dependent variable	β (standardized path coefficient and product)	<i>p</i>	SE	95% confidence interval for mean indirect effect ^a (lower and upper)
Attachment Security	Dialectical Thinking	Mindfulness	$-.65 \times -.02 = .01$.685	.172	-.213, .294

Note. *N* = 283.

Directions for Future Research

As illustrated by this study, the conceptualization and measurement of the construct of dialectical thinking poses challenges that will need to be addressed in future research. To date, few scales have been developed to measure the construct (the two scales used in this study were the only ones found by the researchers in their search of over 25 years of published research). Moreover, Spencer-Rodgers et al. (2004) cautioned against the use of the Dialectical Self Scale (DSS) as a general measure of dialectical thinking, explaining that the scale was developed to assess dialectical thinking in the domain of self-perception only. Although it was not the intent of this investigator to use the DSS as a general measure of dialectical thinking, the findings of this study suggest that the level of endorsement of dialectical thinking across cognitive domains may not necessarily be strongly correlated. Notably, the factor loadings, though significant, were

low for the other measure of dialectical thinking used in this study (i.e., the SPBI).

Although the use of these two measures of dialectical thinking is admissible given the fact that they are the only ones currently available, they may not be ideal for future studies.

In light of this, an important direction for future research would be to develop new measures to assess dialectical thinking—particularly as it is applied to other cognitive domains, such as one’s perceptions of others. As we had suggested earlier, it is possible that the scales used to measure dialectical thinking in this study actually operationalized a type of poorly-integrated and fragmented form of dialecticalism more akin to cognitive splitting. In light of this, another possible direction for scale development might be to create an instrument whose items explicitly target a more integrated or synthesized dialecticalism. Said differently, a new scale on dialectical thinking could be developed that not only tests for the simultaneous endorsement of contradicting sentiments, but also the synthesis or integration of those sentiments. For example, an item that reads, “I sometimes believe two things that contradict each other” might be re-worded in a new scale as: “I sometimes believe two things that contradict each other because I believe they are part of the same whole.”

Another potential direction for research implicated by this study concerns the unexpected finding that dialectical thinking was negatively correlated with both attachment security as well as mindfulness. As suggested earlier, one possible explanation for this could be that the available measures of dialectical thinking do not explicitly assess the level of integration or synthesis of participants’ endorsed contradictory/paradoxical views. Because this study used a college-aged sample, it is

possible that many of the participants are less developed—as far as ego development is concerned. At higher levels of ego development, people may in fact be better equipped to frame or reconcile internal contradictions in favorable ways that both enhance the quality of their important relationships and promote acceptance-based coping capabilities. Said differently, dialectical self-thinking (i.e., the endorsement of contradictory/paradoxical assertions concerning the self) may actually tap into a construct that more closely resembles splitting for persons at lower levels of ego development. Future research might investigate the veracity of this claim; that is, to verify whether ego organization (which may be operationalized via instruments that assess participants' early learning experiences and level of self-exploration) actually moderates the relationship between dialectical thinking and both attachment security as well as mindfulness. Specifically, such a study would seek to empirically confirm two hypotheses: (1) for persons at lower levels of ego development, dialectical thinking will be negatively correlated with attachment security and mindfulness, and (2) for persons at higher levels of ego development, dialectical thinking will be positively correlated with attachment security and mindfulness.

In addition, future research may also investigate the construct of dialectical thinking (as it is assessed by the two scales used in this study) alongside other scales that measure potentially theoretically-related constructs such as splitting, cognitive dissonance, and avoidance. Concerning the significant negative correlation that was found between dialectical thinking and mindfulness, it is possible that other constructs in fact mediate this relationship. For example, dialectical thinking may be negatively correlated with mindfulness because of its possible association with decreased self-

esteem. That is, individuals may be less mindful of their present experience because their conflicting cognitive self-endorsements create an inconsistent and ever-shifting set of criterion to base their self-worth upon.

Last, this research revealed a significant relationship with a large effect size between attachment security and mindfulness. Although the construct of dialectical thinking was not found to mediate this relationship, future research could explore other constructs that might mediate this relationship or account for the remaining unexplained variance in mindfulness. Such constructs may include other variables relating to cognitive flexibility and adaptiveness, such as coping style and coping flexibility.

Conclusion

To our knowledge, the present study is the first to empirically evaluate both cognitively-oriented as well as relationally-oriented precursors of mindfulness via two mediational models side by side. Knowledge relating to the social and/or psychological antecedents that support or hinder the development of mindfulness has been highlighted as an area in need of further understanding (Brown & Ryan, 2003). The preliminary empirical evidence, found here, contributes to the literature by highlighting the salience of interpersonal tendencies and the quality of one's relationships as factors that can not only directly enhance one's disposition towards mindfulness, but also mitigate the potential negative effects of fragmented and poorly-integrated beliefs and cognitions concerning the self or others. Altogether, this study lends credence to the conceptualization of mindfulness as a relational construct in addition to a purely cognitive or attentional one.

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